SEQUENCE LISTING

<110> LEY, Arthur C.
GUTERMAN, Sonia K.
MARKLAND, William
KENT, Rachel B.
ROBERTS, Bruce L.
LADNER, Robert C.

<120> ITI-D1 KUNITZ DOMAIN MUTANTS AS HNE INHIBITORS

<130> D0617.7005US01

<140> 10/038,722
<141> 2002-01-08

<150> US 08/849,406
<151> 1999-07-21

<150> PCT/US95/16349
<151> 1995-12-15

<150> US 08/358,160
<151> 1994-12-16

<150> US 08/133,031
<151> 1992-02-28

<160> 143

<170> PatentIn version 3.1

<210> 1
<211> 276
<212> DNA
<213> Artificial Sequence

<220>

<223> IIIsp::bpti::matureIII (initial fragment)

<400> 1
gtgaaaaaat tattattcgc aattccttta gttgttcctt tctattctgg cgcccgtccg 60

gatttctgtc tcgagccacc atacactggg ccctgcaaag cgcgcatcat ccgctatttc 120

tacaatgcta aagcaggcct gtgccagacc tttgtatacg gtggttgccg tgctaagcgt 180

aacaacttta aatcggccga agattgcatg cgtacctgcg gtggcgccgc tgaaactgtt 240

gaaagttgtt tagcaaaacc ccatacagaa aattca 276

<210> 2
<211> 92
<212> PRT
<213> Artificial Sequence

<220>

<223> IIIsp::bpti::matureIII (initial fragment)

<400> 2

```
Met Lys Lys Leu Leu Phe Ala Ile Pro Leu Val Val Pro Phe Tyr Ser
1               5                  10                  15

Gly Ala Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys
            20                  25                  30

Lys Ala Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys
        35                  40                  45

Gln Thr Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys
    50                  55                  60

Ser Ala Glu Asp Cys Met Arg Thr Cys Gly Gly Ala Ala Glu Thr Val
65                  70                  75                  80

Glu Ser Cys Leu Ala Lys Pro His Thr Glu Asn Ser
                85                  90
```

<210> 3
<211> 285
<212> DNA
<213> Artificial Sequence

<220>

<223> IIIsp::itiD1::mature III fusion gene

<400> 3

```
gtgaaaaaat tattattcgc aattccttta gttgttcctt tctattctgg cgccaaagaa     60

gactcttgcc agctgggcta ctcggccggt ccctgcatgg gaatgaccag caggtatttc    120

tataatggta catccatggc ctgtgagact ttccagtacg gcggctgcat gggcaacggt    180

aacaacttcg tcacagaaaa ggagtgtctg cagacctgcc gaactgtggg cgccgctgaa    240

actgttgaaa gttgtttagc aaaaccccat acagaaaatt cattt                    285
```

<210> 4
<211> 95
<212> PRT
<213> Artificial Sequence

<220>

<223> IIIsp::itiD1::mature III fusion gene

<400> 4

```
Met Lys Lys Leu Leu Phe Ala Ile Pro Leu Val Val Pro Phe Tyr Ser
1               5                  10                  15

Gly Ala Lys Glu Asp Ser Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys
            20                  25                  30
```

Met Gly Met Thr Ser Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys
35 40 45

Glu Thr Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val
50 55 60

Thr Glu Lys Glu Cys Leu Gln Thr Cys Arg Thr Val Gly Ala Ala Glu
65 70 75 80

Thr Val Glu Ser Cys Leu Ala Lys Pro His Thr Glu Asn Ser Phe
85 90 95

<210> 5
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Consensus Kunitz domain

<400> 5

Arg Pro Asp Phe Cys Leu Leu Pro Ala Glu Thr Gly Pro Cys Arg Ala
1 5 10 15

Met Ile Pro Arg Phe Tyr Tyr Asn Ala Lys Ser Gly Lys Cys Glu Pro
20 25 30

Phe Ile Tyr Gly Gly Cys Gly Gly Asn Ala Asn Asn Phe Lys Thr Glu
35 40 45

Glu Glu Cys Arg Arg Thr Cys Gly Gly Ala
50 55

<210> 6
<211> 58
<212> PRT
<213> Bos Taurus

<400> 6

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1 5 10 15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 7
<211> 58

<212> PRT
<213> Artificial Sequence
<220>

<223> Epi-HNE-1

<400> 7

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Ile Ala
1 5 10 15

Phe Phe Pro Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 8
<211> 62
<212> PRT
<213> Artificial Sequence

<220>

<223> Epi-HNE-2

<400> 8

Glu Ala Glu Ala Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly
1 5 10 15

Pro Cys Ile Ala Phe Phe Pro Arg Tyr Phe Tyr Asn Ala Lys Ala Gly
20 25 30

Leu Cys Gln Thr Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn
35 40 45

Phe Lys Ser Ala Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55 60

<210> 9
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> EpiNE7

<400> 9

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Val Ala
1 5 10 15

Met Phe Pro Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 10
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> EpiNE3

<400> 10

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Val Gly
1 5 10 15

Phe Phe Ser Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 11
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> EpiNE6

<400> 11

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Val Gly
1 5 10 15

Phe Phe Gln Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 12
<211> 58
<212> PRT
<213> Artificial Sequence

<220>
<223> EpiNE4

<400> 12

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Val Ala
1 5 10 15

Ile Phe Pro Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 13
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> EpiNE8

<400> 13

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Val Ala
1 5 10 15

Phe Phe Lys Arg Ser Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 14
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> EpiNE5

<400> 14

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Ile Ala
1 5 10 15

Phe Phe Gln Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala

35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 15
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> EpiNE2

<400> 15

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Ile Ala
1 5 10 15

Leu Phe Lys Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 16
<211> 58
<212> PRT
<213> Homo sapiens

<400> 16

Lys Glu Asp Ser Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Met Gly
1 5 10 15

Met Thr Ser Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
20 25 30

Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
35 40 45

Lys Asp Cys Leu Gln Thr Cys Arg Thr Val
50 55

<210> 17
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> BITI-E7-141

<400> 17

```
Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Ala
1               5                   10                  15
Met Phe Pro Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55
```

<210> 18
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> MUTT26A

<400> 18

```
Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Ala
1               5                   10                  15

Met Phe Pro Arg Tyr Phe Tyr Asn Gly Ala Ser Met Ala Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55
```

<210> 19
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> MUTQE

<400> 19

```
Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Ala
1               5                   10                  15

Met Phe Pro Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55
```

<210> 20

<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> MUT1619

<400> 20

Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Gly
1 5 10 15

Met Phe Ser Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
35 40 45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
50 55

<210> 21
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> ITI-D1E7

<400> 21

Lys Glu Asp Ser Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Ala
1 5 10 15

Met Phe Pro Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
20 25 30

Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
35 40 45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
50 55

<210> 22
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> AMINO1

<400> 22

Lys Glu Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Ala
1 5 10 15

```
Met Phe Pro Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
            20                  25                  30
Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55


<210>  23
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  AMINO2

<400>  23

Lys Pro Asp Ser Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Ala
1               5                   10                  15

Met Phe Pro Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
            20                  25                  30

Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55


<210>  24
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  MUTP1

<400>  24

Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Ile Gly
1               5                   10                  15

Met Phe Ser Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
            20                  25                  30

Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55


<210>  25
<211>  58
<212>  PRT
<213>  Homo sapiens
```

<400> 25

Thr Val Ala Ala Cys Asn Leu Pro Ile Val Arg Gly Pro Cys Arg Ala
1 5 10 15

Phe Ile Gln Leu Trp Ala Phe Asp Ala Val Lys Gly Lys Cys Val Leu
20 25 30

Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe Tyr Ser Glu
35 40 45

Lys Glu Cys Arg Glu Tyr Cys Gly Val Pro
50 55

<210> 26
<211> 56
<212> PRT
<213> Artificial Sequence

<220>

<223> Epi-HNE-3

<400> 26

Ala Ala Cys Asn Leu Pro Ile Val Arg Gly Pro Cys Ile Ala Phe Phe
1 5 10 15

Pro Arg Trp Ala Phe Asp Ala Val Lys Gly Lys Cys Val Leu Phe Pro
20 25 30

Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe Tyr Ser Glu Lys Glu
35 40 45

Cys Arg Glu Tyr Cys Gly Val Pro
50 55

<210> 27
<211> 56
<212> PRT
<213> Artificial Sequence

<220>

<223> Epi-HNE-4

<400> 27

Glu Ala Cys Asn Leu Pro Ile Val Arg Gly Pro Cys Ile Ala Phe Phe
1 5 10 15

Pro Arg Trp Ala Phe Asp Ala Val Lys Gly Lys Cys Val Leu Phe Pro
20 25 30

Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe Tyr Ser Glu Lys Glu

```
        35                  40                  45

Cys Arg Glu Tyr Cys Gly Val Pro
    50                  55
<210>  28
<211>  58
<212>  PRT
<213>  Homo sapiens

<400>  28

Val Arg Glu Val Cys Ser Glu Gln Ala Glu Thr Gly Pro Cys Arg Ala
1               5                   10                  15

Met Ile Ser Arg Trp Tyr Phe Asp Val Thr Glu Gly Lys Cys Ala Pro
            20                  25                  30

Phe Phe Tyr Gly Gly Cys Gly Gly Asn Arg Asn Asn Phe Asp Thr Glu
        35                  40                  45

Glu Tyr Cys Met Ala Val Cys Gly Ser Ala
    50                  55


<210>  29
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  DPI.1.1

<400>  29

Val Arg Glu Val Cys Ser Glu Gln Ala Tyr Thr Gly Pro Cys Ile Ala
1               5                   10                  15

Phe Phe Pro Arg Tyr Tyr Phe Asp Val Thr Glu Gly Lys Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Asp Thr Glu
        35                  40                  45

Glu Tyr Cys Met Ala Val Cys Gly Ser Ala
    50                  55


<210>  30
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  DPI.1.2

<400>  30

Val Arg Glu Val Cys Ser Glu Gln Ala Glu Thr Gly Pro Cys Ile Ala
1               5                   10                  15
```

```
Met Phe Ser Arg Trp Tyr Phe Asp Val Thr Glu Gly Lys Cys Ala Pro
            20                  25                  30

Phe Val Tyr Gly Gly Cys Gly Gly Asn Arg Asn Asn Phe Asp Thr Glu
        35                  40                  45


Glu Tyr Cys Met Ala Val Cys Gly Ser Ala
    50                  55
```

<210> 31
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.1.3

<400> 31

```
Val Arg Glu Val Cys Ser Glu Gln Ala Glu Thr Gly Pro Cys Ile Ala
1               5                   10                  15

Phe Phe Ser Arg Trp Tyr Phe Asp Val Thr Glu Gly Lys Cys Ala Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Met Gly Asn Arg Asn Asn Phe Asp Thr Glu
        35                  40                  45

Glu Tyr Cys Met Ala Val Cys Gly Ser Ala
    50                  55
```

<210> 32
<211> 58
<212> PRT
<213> Homo sapiens

<400> 32

```
Asn Ala Glu Ile Cys Leu Leu Pro Leu Asp Tyr Gly Pro Cys Arg Ala
1               5                   10                  15

Leu Leu Leu Arg Tyr Tyr Tyr Asp Arg Tyr Thr Gln Ser Cys Arg Gln
            20                  25                  30

Phe Leu Tyr Gly Gly Cys Glu Gly Asn Ala Asn Asn Phe Tyr Thr Trp
        35                  40                  45

Glu Ala Cys Asp Asp Ala Cys Trp Arg Ile
    50                  55
```

<210> 33
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.2.1

<400> 33

```
Asn Ala Glu Ile Cys Leu Leu Pro Leu Tyr Thr Gly Pro Cys Ile Ala
1               5                  10                  15

Phe Phe Pro Arg Tyr Tyr Tyr Asp Arg Tyr Thr Gln Ser Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Met Gly Asn Ala Asn Asn Phe Tyr Thr Trp
        35                  40                  45

Glu Ala Cys Asp Asp Ala Cys Trp Arg Ile
    50                  55
```

<210> 34
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.2.2

<400> 34

```
Asn Ala Glu Ile Cys Leu Leu Pro Leu Asp Tyr Gly Pro Cys Ile Ala
1               5                  10                  15

Leu Phe Leu Arg Tyr Tyr Tyr Asp Arg Tyr Thr Gln Ser Cys Arg Gln
            20                  25                  30

Phe Val Tyr Gly Gly Cys Glu Gly Asn Ala Asn Asn Phe Tyr Thr Trp
        35                  40                  45

Glu Ala Cys Asp Asp Ala Cys Trp Arg Ile
    50                  55
```

<210> 35
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.2.3

<400> 35

```
Asn Ala Glu Ile Cys Leu Leu Pro Leu Asp Thr Gly Pro Cys Ile Ala
1               5                  10                  15

Phe Phe Leu Arg Tyr Tyr Tyr Asp Arg Tyr Thr Gln Ser Cys Gln Thr
```

```
            20                  25                  30

Phe Val Tyr Gly Gly Cys Met Gly Asn Ala Asn Asn Phe Tyr Thr Trp
        35                  40                  45

Glu Ala Cys Asp Asp Ala Cys Trp Arg Ile
    50                  55

<210>  36
<211>  61
<212>  PRT
<213>  Homo sapiens

<400>  36

Val Pro Lys Val Cys Arg Leu Gln Val Ser Val Asp Asp Gln Cys Glu
1               5                   10                  15

Gly Ser Thr Glu Lys Tyr Phe Phe Asn Leu Ser Ser Met Thr Cys Glu
            20                  25                  30

Lys Phe Phe Ser Gly Gly Cys His Arg Asn Arg Ile Glu Asn Arg Phe
        35                  40                  45

Pro Asp Glu Ala Thr Cys Met Gly Phe Cys Ala Pro Lys
    50                  55                  60


<210>  37
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  DPI.3.1

<400>  37

Val Pro Lys Val Cys Arg Leu Gln Val Val Arg Gly Pro Cys Ile Ala
1               5                   10                  15

Phe Phe Pro Arg Trp Phe Phe Asn Leu Ser Ser Met Thr Cys Val Leu
            20                  25                  30

Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Arg Phe Pro Asp Glu
        35                  40                  45

Ala Thr Cys Met Gly Phe Cys Ala Pro Lys
    50                  55


<210>  38
<211>  61
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  DPI.3.2
```

<400> 38

Val Pro Lys Val Cys Arg Leu Gln Val Ser Val Asp Asp Gln Cys Ile
1 5 10 15

Gly Ser Phe Glu Lys Tyr Phe Phe Asn Leu Ala Ser Met Thr Cys Glu
20 25 30

Thr Phe Val Ser Gly Gly Cys His Arg Asn Arg Ile Glu Asn Arg Phe
35 40 45

Pro Asp Glu Ala Thr Cys Met Gly Phe Cys Ala Pro Lys
50 55 60

<210> 39
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.3.3

<400> 39

Val Pro Lys Val Cys Arg Leu Gln Val Val Ala Gly Pro Cys Ile Gly
1 5 10 15

Phe Phe Lys Arg Tyr Phe Phe Ala Leu Ser Ser Met Thr Cys Glu Thr
20 25 30

Phe Val Ser Gly Gly Cys His Arg Asn Arg Asn Arg Phe Pro Asp Glu
35 40 45

Ala Thr Cys Met Gly Phe Cys Ala Pro Lys
50 55

<210> 40
<211> 58
<212> PRT
<213> Homo sapiens

<400> 40

Ile Pro Ser Phe Cys Tyr Ser Pro Lys Asp Glu Gly Leu Cys Ser Ala
1 5 10 15

Asn Val Thr Arg Tyr Tyr Phe Asn Pro Arg Tyr Arg Thr Cys Asp Ala
20 25 30

Phe Thr Tyr Thr Gly Cys Gly Gly Asn Asp Asn Asn Phe Val Ser Arg
35 40 45

Glu Asp Cys Lys Arg Ala Cys Ala Lys Ala
50 55

<210> 41
<211> 58

<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.4.1

<400> 41

Ile Pro Ser Phe Cys Tyr Ser Pro Lys Ser Ala Gly Pro Cys Val Ala
1 5 10 15

Met Phe Pro Arg Tyr Tyr Phe Asn Pro Arg Tyr Arg Thr Cys Glu Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Ser Arg
35 40 45

Glu Asp Cys Lys Arg Ala Cys Ala Lys Ala
50 55

<210> 42
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.4.2

<400> 42

Ile Pro Ser Phe Cys Tyr Ser Pro Lys Asp Glu Gly Leu Cys Ile Ala
1 5 10 15

Phe Phe Thr Arg Tyr Tyr Phe Asn Pro Arg Tyr Arg Thr Cys Asp Ala
20 25 30

Phe Thr Tyr Thr Gly Cys Gly Gly Asn Asp Asn Asn Phe Val Ser Arg
35 40 45

Glu Asp Cys Lys Arg Ala Cys Ala Lys Ala
50 55

<210> 43
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.4.3

<400> 43

Ile Pro Ser Phe Cys Tyr Ser Pro Lys Asp Thr Gly Pro Cys Ile Ala

1 5 10 15

Phe Phe Thr Arg Tyr Tyr Phe Asn Pro Arg Tyr Arg Thr Cys Asp Thr
20 25 30

Phe Val Tyr Gly Gly Cys Gly Gly Asn Asp Asn Asn Phe Val Ser Arg
35 40 45

Glu Asp Cys Lys Arg Ala Cys Ala Lys Ala
50 55

<210> 44
<211> 58
<212> PRT
<213> Homo sapiens

<400> 44

Met His Ser Phe Cys Ala Phe Lys Ala Asp Asp Gly Pro Cys Lys Ala
1 5 10 15

Ile Met Lys Arg Phe Phe Phe Asn Ile Phe Thr Arg Gln Cys Glu Glu
20 25 30

Phe Ile Tyr Gly Gly Cys Glu Gly Asn Gln Asn Arg Phe Glu Ser Leu
35 40 45

Glu Glu Cys Lys Lys Met Cys Thr Arg Asp
50 55

<210> 45
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.5.1

<400> 45

Met His Ser Phe Cys Ala Phe Lys Ala Ser Ala Gly Pro Cys Val Ala
1 5 10 15

Met Phe Pro Arg Tyr Phe Phe Asn Ile Phe Thr Arg Gln Cys Glu Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Arg Phe Glu Ser Leu
35 40 45

Glu Glu Cys Lys Lys Met Cys Thr Arg Asp
50 55

<210> 46
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.5.2

<400> 46

Met His Ser Phe Cys Ala Phe Lys Ala Asp Asp Gly Pro Cys Ile Ala
1 5 10 15

Ile Phe Lys Arg Phe Phe Phe Asn Ile Phe Thr Arg Gln Cys Glu Glu
20 25 30

Phe Ile Tyr Gly Gly Cys Glu Gly Asn Gln Asn Arg Phe Glu Ser Leu
35 40 45

Glu Glu Cys Lys Lys Met Cys Thr Arg Asp
50 55

<210> 47
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.5.3

<400> 47

Met His Ser Phe Cys Ala Phe Lys Ala Tyr Thr Gly Pro Cys Ile Ala
1 5 10 15

Phe Phe Lys Arg Phe Phe Phe Asn Ile Phe Thr Arg Gln Cys Glu Thr
20 25 30

Phe Ile Tyr Gly Gly Cys Glu Gly Asn Gln Asn Arg Phe Glu Ser Leu
35 40 45

Glu Glu Cys Lys Lys Met Cys Thr Arg Asp

50 55

<210> 48
<211> 58
<212> PRT
<213> Homo sapiens

<400> 48

Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Ile Cys Arg Gly
1 5 10 15

Tyr Ile Thr Arg Tyr Phe Tyr Asn Asn Gln Thr Lys Gln Cys Glu Arg
20 25 30

Phe Lys Tyr Gly Gly Cys Leu Gly Asn Met Asn Asn Phe Glu Thr Leu
35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 49
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.6.1

<400> 49

Lys Pro Asp Phe Cys Phe Leu Glu Glu Ser Ala Gly Pro Cys Val Ala
1 5 10 15

Met Phe Pro Arg Tyr Phe Tyr Asn Asn Gln Thr Lys Gln Cys Glu Thr
20 25 30

Phe Val Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Glu Thr Leu
35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 50
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.6.2

<400> 50

Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Ile Cys Val Gly
1 5 10 15

Tyr Phe Thr Arg Tyr Phe Tyr Asn Asn Gln Thr Lys Gln Cys Glu Arg
20 25 30

Phe Lys Tyr Gly Gly Cys Leu Gly Asn Met Asn Asn Phe Glu Thr Leu
35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 51
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.6.3

<400> 51

Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Ile Cys Val Gly
1 5 10 15

Phe Phe Thr Arg Tyr Phe Tyr Asn Asn Gln Thr Lys Gln Cys Glu Arg
20 25 30

Phe Val Tyr Gly Gly Cys Leu Gly Asn Met Asn Asn Phe Glu Thr Leu
35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 52
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.6.4

<400> 52

Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Ile Cys Val Gly
1 5 10 15

Phe Phe Thr Arg Tyr Phe Tyr Asn Ala Gln Thr Lys Gln Cys Glu Arg
20 25 30

Phe Val Tyr Gly Gly Cys Leu Gly Asn Met Asn Asn Phe Glu Thr Leu
35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 53
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.6.5

<400> 53

Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Pro Cys Val Gly
1 5 10 15

Phe Phe Gln Arg Tyr Phe Tyr Asn Ala Gln Thr Lys Gln Cys Glu Arg
20 25 30

Phe Val Tyr Gly Gly Cys Gln Gly Asn Met Asn Asn Phe Glu Thr Leu
35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 54
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.6.6

<400> 54

Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Pro Cys Val Gly
1 5 10 15
Phe Phe Thr Arg Tyr Phe Tyr Asn Asn Gln Thr Lys Gln Cys Glu Arg
20 25 30

Phe Val Tyr Gly Gly Cys Gln Gly Asn Met Asn Asn Phe Glu Thr Leu
35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 55
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.6.7

<400> 55

Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Pro Cys Ile Gly
1 5 10 15

Phe Phe Pro Arg Tyr Phe Tyr Asn Asn Gln Thr Lys Gln Cys Glu Arg
20 25 30

Phe Val Tyr Gly Gly Cys Gln Gly Asn Met Asn Asn Phe Glu Thr Leu

35 40 45

Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly
50 55

<210> 56
<211> 58
<212> PRT
<213> Homo sapiens

<400> 56

Gly Pro Ser Trp Cys Leu Thr Pro Ala Asp Arg Gly Leu Cys Arg Ala
1 5 10 15

Asn Glu Asn Arg Phe Tyr Tyr Asn Ser Val Ile Gly Lys Cys Arg Pro

```
            20                  25                  30

Phe Lys Tyr Ser Gly Cys Gly Gly Asn Glu Asn Asn Phe Thr Ser Lys
        35                  40                  45

Gln Glu Cys Leu Arg Ala Cys Lys Lys Gly
    50                  55


<210>  57
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  DPI.7.1

<400>  57

Gly Pro Ser Trp Cys Leu Thr Pro Ala Val Arg Gly Pro Cys Ile Ala
1               5                   10                  15

Phe Phe Pro Arg Trp Tyr Tyr Asn Ser Val Ile Gly Lys Cys Val Leu
            20                  25                  30

Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Asn Phe Thr Ser Lys
        35                  40                  45

Gln Glu Cys Leu Arg Ala Cys Lys Lys Gly
    50                  55


<210>  58
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  DPI.7.2

<400>  58

Gly Pro Ser Trp Cys Leu Thr Pro Ala Asp Arg Gly Leu Cys Val Ala
1               5                   10                  15

Asn Phe Asn Arg Phe Tyr Tyr Asn Ser Val Ile Gly Lys Cys Arg Pro
            20                  25                  30

Phe Lys Tyr Ser Gly Cys Gly Gly Asn Glu Asn Asn Phe Thr Ser Lys
        35                  40                  45

Gln Glu Cys Leu Arg Ala Cys Lys Lys Gly
    50                  55


<210>  59
<211>  58
<212>  PRT
<213>  Artificial Sequence
```

<220>

<223> DPI.7.3

<400> 59

```
Gly Pro Ser Trp Cys Leu Thr Pro Ala Asp Arg Gly Leu Cys Val Ala
1               5                  10                  15

Phe Phe Asn Arg Phe Tyr Tyr Asn Ser Val Ile Gly Lys Cys Arg Pro
            20                  25                  30

Phe Lys Tyr Ser Gly Cys Gly Gly Asn Glu Asn Asn Phe Lys Ser Lys
        35                  40                  45

Gln Glu Cys Leu Arg Ala Cys Lys Lys Gly
    50                  55
```

<210> 60
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.7.4

<400> 60

```
Gly Pro Ser Trp Cys Leu Thr Pro Ala Val Arg Gly Pro Cys Val Ala
1               5                  10                  15

Phe Phe Asn Arg Phe Tyr Tyr Asn Ser Val Ile Gly Lys Cys Arg Pro
            20                  25                  30

Phe Lys Tyr Gly Gly Cys Gly Gly Asn Glu Asn Asn Phe Lys Ser Lys
        35                  40                  45

Gln Glu Cys Leu Arg Ala Cys Lys Lys Gly
    50                  55
```

<210> 61
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.7.5

<400> 61

```
Gly Pro Ser Trp Cys Leu Thr Pro Ala Asp Arg Gly Pro Cys Ile Ala
1               5                  10                  15

Phe Phe Pro Arg Trp Tyr Tyr Asn Ser Val Ile Gly Lys Cys Gln Thr
            20                  25                  30
```

Phe Val Tyr Gly Gly Cys Gly Gly Asn Glu Asn Asn Phe Ala Ser Lys
35 40 45

Gln Glu Cys Leu Arg Ala Cys Lys Lys Gly
50 55

<210> 62
<211> 58
<212> PRT
<213> Homo sapiens

<400> 62

Glu Thr Asp Ile Cys Lys Leu Pro Lys Asp Glu Gly Thr Cys Arg Asp
1 5 10 15
Phe Ile Leu Lys Trp Tyr Tyr Asp Pro Asn Thr Lys Ser Cys Ala Arg
20 25 30

Phe Trp Tyr Gly Gly Cys Gly Gly Asn Glu Asn Lys Phe Gly Ser Gln
35 40 45

Lys Glu Cys Glu Lys Val Cys Ala Pro Val
50 55

<210> 63
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.8.1

<400> 63

Glu Thr Asp Ile Cys Lys Leu Pro Lys Val Arg Gly Pro Cys Ile Ala
1 5 10 15

Phe Phe Pro Arg Trp Tyr Tyr Asp Pro Asn Thr Lys Ser Cys Val Leu
20 25 30

Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe Gly Ser Gln
35 40 45

Lys Glu Cys Glu Lys Val Cys Ala Pro Val
50 55

<210> 64
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.8.2

<400> 64

```
Glu Thr Asp Ile Cys Lys Leu Pro Lys Asp Glu Gly Thr Cys Ile Ala
1               5                   10                  15

Phe Phe Leu Lys Trp Tyr Tyr Asp Pro Asn Thr Lys Ser Cys Ala Arg
            20                  25                  30

Phe Val Tyr Gly Gly Cys Gly Gly Asn Glu Asn Lys Phe Gly Ser Gln
        35                  40                  45

Lys Glu Cys Glu Lys Val Cys Ala Pro Val
    50                  55
```

<210> 65
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.8.3

<400> 65

```
Glu Thr Asp Ile Cys Lys Leu Pro Lys Asp Glu Gly Pro Cys Ile Ala
1               5                   10                  15

Phe Phe Leu Arg Trp Tyr Tyr Asp Pro Asn Thr Lys Ser Cys Ala Arg
            20                  25                  30

Phe Val Tyr Gly Gly Cys Gly Gly Asn Glu Asn Lys Phe Gly Ser Gln
        35                  40                  45

Lys Glu Cys Glu Lys Val Cys Ala Pro Val
    50                  55
```

<210> 66
<211> 58
<212> PRT
<213> Homo sapiens

<400> 66

```
Leu Pro Asn Val Cys Ala Phe Pro Met Glu Lys Gly Pro Cys Gln Thr
1               5                   10                  15

Tyr Met Thr Arg Trp Phe Phe Asn Phe Glu Thr Gly Glu Cys Glu Leu
            20                  25                  30

Phe Ala Tyr Gly Gly Cys Gly Gly Asn Ser Asn Asn Phe Leu Arg Lys
        35                  40                  45

Glu Lys Cys Glu Lys Phe Cys Lys Phe Thr
    50                  55
```

<210> 67
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.9.1

<400> 67

```
Leu Pro Asn Val Cys Ala Phe Pro Met Val Arg Gly Pro Cys Ile Ala
1               5                   10                  15

Phe Phe Pro Arg Trp Phe Phe Asn Phe Glu Thr Gly Glu Cys Val Leu
            20                  25                  30

Phe Val Tyr Gly Gly Cys Gln Gly Asn Gly Asn Asn Phe Leu Arg Lys
        35                  40                  45

Glu Lys Cys Glu Lys Phe Cys Lys Phe Thr
    50                  55
```

<210> 68
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.9.2

<400> 68

```
Leu Pro Asn Val Cys Ala Phe Pro Met Glu Lys Gly Pro Cys Ile Ala
1               5                   10                  15

Tyr Phe Thr Arg Trp Phe Phe Asn Phe Glu Thr Gly Glu Cys Glu Leu
            20                  25                  30

Phe Ala Tyr Gly Gly Cys Gly Gly Asn Ser Asn Asn Phe Leu Arg Lys
        35                  40                  45

Glu Lys Cys Glu Lys Phe Cys Lys Phe Thr
    50                  55
```

<210> 69
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> DPI.9.3

<400> 69

```
Leu Pro Asn Val Cys Ala Phe Pro Met Glu Lys Gly Pro Cys Ile Ala
1               5                   10                  15

Tyr Phe Pro Arg Trp Phe Phe Asn Phe Glu Thr Gly Glu Cys Val Leu
```

20 25 30

Phe Val Tyr Gly Gly Cys Gly Gly Asn Ser Asn Asn Phe Leu Arg Lys
35 40 45

Glu Lys Cys Glu Lys Phe Cys Lys Phe Thr
50 55

<210> 70
<211> 8157
<212> DNA
<213> Artificial Sequence

<220>

<223> Plasmid pHIL-D2

<400> 70
agatcgcggc cgcgatctaa catccaaaga cgaaaggttg aatgaaacct ttttgccatc 60

cgacatccac aggtccattc tcacacataa gtgccaaacg caacaggagg ggatacacta 120

gcagcagacc gttgcaaacg caggacctcc actcctcttc tcctcaacac ccacttttgc 180

catcgaaaaa ccagcccagt tattgggctt gattggagct cgctcattcc aattccttct 240

attaggctac taacaccatg actttattag cctgtctatc ctggcccccc tggcgaggtc 300

atgtttgttt atttccgaat gcaacaagct ccgcattaca cccgaacatc actccagatg 360

agggctttct gagtgtgggg tcaaatagtt tcatgttccc aaatggccca aaactgacag 420

tttaaacgct gtcttggaac ctaatatgac aaaagcgtga tctcatccaa gatgaactaa 480

gtttggttcg ttgaaatgct aacggccagt tggtcaaaaa gaaacttcca aaagtcgcca 540

taccgtttgt cttgtttggt attgattgac gaatgctcaa aaataatctc attaatgctt 600

agcgcagtct ctctatcgct tctgaacccg gtggcacctg tgccgaaacg caaatgggga 660

aacaacccgc tttttggatg attatgcatt gtcctccaca ttgtatgctt ccaagattct 720

ggtgggaata ctgctgatag cctaacgttc atgatcaaaa tttaactgtt ctaaccccta 780

cttgacaggc aatatataaa cagaaggaag ctgccctgtc ttaaaccttt ttttttatca 840

tcattattag cttactttca taattgcgac tggttccaat tgacaagctt ttgattttaa 900

cgacttttaa cgacaacttg agaagatcaa aaaacaacta attattcgaa acgaggaatt 960

cgccttagac atgactgttc ctcagttcaa gttgggcatt acgagaagac cggtcttgct 1020

agattctaat caagaggatg tcagaatgcc atttgcctga gagatgcagg cttcatttt 1080

gatacttttt tatttgtaac ctatatagta taggattttt tttgtcattt tgtttcttct 1140

cgtacgagct tgctcctgat cagcctatct cgcagctgat gaatatcttg tggtaggggt 1200

ttgggaaaat cattcgagtt tgatgttttt cttggtattt cccactcctc ttcagagtac 1260

agaagattaa gtgagaagtt cgtttgtgca agcttatcga taagctttaa tgcggtagtt 1320

tatcacagtt aaattgctaa cgcagtcagg caccgtgtat gaaatctaac aatgcgctca 1380

tcgtcatcct cggcaccgtc accctggatg ctgtaggcat aggcttggtt atgccggtac 1440

tgccgggcct cttgcgggat atcgtccatt ccgacagcat cgccagtcac tatggcgtgc 1500

tgctagcgct atatgcgttg atgcaatttc tatgcgcacc cgttctcgga gcactgtccg 1560

accgctttgg ccgccgccca gtcctgctcg cttcgctact tggagccact atcgactacg 1620

cgatcatggc gaccacaccc gtcctgtgga tctatcgaat ctaaatgtaa gttaaaatct 1680

ctaaataatt aaataagtcc cagtttctcc atacgaacct taacagcatt gcggtgagca 1740

tctagacctt caacagcagc cagatccatc actgcttggc caatatgttt cagtccctca 1800

ggagttacgt cttgtgaagt gatgaacttc tggaaggttg cagtgttaac tccgctgtat 1860

tgacgggcat atccgtacgt tggcaaagtg tggttggtac cggaggagta atctccacaa 1920

ctctctggag agtaggcacc aacaaacaca gatccagcgt gttgtacttg atcaacataa 1980

gaagaagcat tctcgatttg caggatcaag tgttcaggag cgtactgatt ggacatttcc 2040

aaagcctgct cgtaggttgc aaccgatagg gttgtagagt gtgcaataca cttgcgtaca 2100

atttcaaccc ttggcaactg cacagcttgg ttgtgaacag catcttcaat tctggcaagc 2160

tccttgtctg tcatatcgac agccaacaga atcacctggg aatcaatacc atgttcagct 2220

tgagcagaag gtctgaggca acgaaatctg gatcagcgta tttatcagca ataactagaa 2280

cttcagaagg cccagcaggc atgtcaatac tacacagggc tgatgtgtca ttttgaacca 2340

tcatcttggc agcagtaacg aactggtttc ctggaccaaa tattttgtca cacttaggaa 2400

cagtttctgt tccgtaagcc atagcagcta ctgcctgggc gcctcctgct agcacgatac 2460

acttagcacc aaccttgtgg gcaacgtaga tgacttctgg ggtaagggta ccatccttct 2520

taggtggaga tgcaaaaaca atttctttgc aaccagcaac tttggcagga acacccagca 2580

tcagggaagt ggaaggcaga attgcggttc caccaggaat atagaggcca actttctcaa 2640

taggtcttgc aaaacgagag cagactacac cagggcaagt ctcaacttgc aacgtctccg 2700

ttagttgagc ttcatggaat ttcctgacgt tatctataga gagatcaatg gctctcttaa 2760

cgttatctgg caattgcata agttcctctg ggaaaggagc ttctaacaca ggtgtcttca 2820

aagcgactcc atcaaacttg gcagttagtt ctaaaagggc tttgtcacca ttttgacgaa 2880

cattgtcgac aattggtttg actaattcca taatctgttc cgttttctgg ataggacgac 2940

gaagggcatc ttcaatttct tgtgaggagg ccttagaaac gtcaattttg cacaattcaa 3000

tacgaccttc agaagggact tctttaggtt tggattcttc tttaggttgt tccttggtgt 3060

atcctggctt ggcatctcct ttccttctag tgacctttag ggacttcata tccaggtttc 3120

tctccacctc gtccaacgtc acaccgtact tggcacatct aactaatgca aaataaaata 3180

agtcagcaca ttcccaggct atatcttcct tggatttagc ttctgcaagt tcatcagctt 3240

cctccctaat tttagcgttc aacaaaactt cgtcgtcaaa taaccgtttg gtataagaac 3300

cttctggagc attgctctta cgatcccaca aggtgcttcc atggctctaa gacccttga 3360

ttggccaaaa caggaagtgc gttccaagtg acagaaacca acacctgttt gttcaaccac 3420

aaatttcaag cagtctccat cacaatccaa ttcgataccc agcaactttt gagttcgtcc 3480

agatgtagca cctttatacc acaaaccgtg acgacgagat tggtagactc cagtttgtgt 3540

ccttatagcc tccggaatag acttttgga cgagtacacc aggcccaacg agtaattaga 3600

agagtcagcc accaaagtag tgaatagacc atcggggcgg tcagtagtca aagacgccaa 3660
caaaatttca ctgacaggga acttttgac atcttcagaa agttcgtatt cagtagtcaa 3720

ttgccgagca tcaataatgg ggattatacc agaagcaaca gtggaagtca catctaccaa 3780

ctttgcggtc tcagaaaaag cataaacagt tctactaccg ccattagtga aacttttcaa 3840

atcgcccagt ggagaagaaa aaggcacagc gatactagca ttagcgggca aggatgcaac 3900

tttatcaacc agggtcctat agataaccct agcgcctggg atcatccttt ggacaactct 3960

ttctgccaaa tctaggtcca aaatcacttc attgatacca ttatacggat gactcaactt 4020

gcacattaac ttgaagctca gtcgattgag tgaacttgat caggttgtgc agctggtcag 4080

cagcataggg aaacacggct tttcctacca aactcaagga attatcaaac tctgcaacac 4140

ttgcgtatgc aggtagcaag ggaaatgtca tacttgaagt cggacagtga gtgtagtctt 4200

gagaaattct gaagccgtat ttttattatc agtgagtcag tcatcaggag atcctctacg 4260

ccggacgcat cgtggccggc atcaccggcg ccacaggtgc ggttgctggc gcctatatcg 4320

ccgacatcac cgatggggaa gatcgggctc gccacttcgg gctcatgagc gcttgtttcg 4380

gcgtgggtat ggtggcaggc cccgtggccg ggggactgtt gggcgccatc tccttgcatg 4440

caccattcct tgcggcggcg gtgctcaacg gcctcaacct actactgggc tgcttcctaa 4500

tgcaggagtc gcataaggga gagcgtcgag tatctatgat tggaagtatg ggaatggtga 4560

tacccgcatt cttcagtgtc ttgaggtctc ctatcagatt atgcccaact aaagcaaccg 4620

gaggaggaga tttcatggta aatttctctg acttttggtc atcagtagac tcgaactgtg 4680

agactatctc ggttatgaca gcagaaatgt ccttcttgga gacagtaaat gaagtcccac 4740

caataaagaa atccttgtta tcaggaacaa acttcttgtt tcgaactttt tcggtgcctt 4800

gaactataaa atgtagagtg gatatgtcgg gtaggaatgg agcgggcaaa tgcttacctt 4860

ctggaccttc aagaggtatg tagggtttgt agatactgat gccaacttca gtgacaacgt 4920

tgctatttcg ttcaaaccat tccgaatcca gagaaatcaa agttgtttgt ctactattga 4980

tccaagccag tgcggtcttg aaactgacaa tagtgtgctc gtgttttgag gtcatctttg 5040

tatgaataaa tctagtcttt gatctaaata atcttgacga gccaaggcga taaataccca 5100

aatctaaaac tcttttaaaa cgttaaaagg acaagtatgt ctgcctgtat taaaccccaa 5160

atcagctcgt agtctgatcc tcatcaactt gaggggcact atcttgtttt agagaaattt 5220

gcggagatgc gatatcgaga aaaaggtacg ctgattttaa acgtgaaatt tatctcaaga 5280

tcgcggccgc gatctcgaat aataactgtt atttttcagt gttcccgatc tgcgtctatt 5340

tcacaatacc aacatgagtc agcttatcga tgataagctg tcaaacatga gaattaattc 5400

gatgataagc tgtcaaacat gagaaatctt gaagacgaaa gggcctcgtg atacgcctat 5460

ttttataggt taatgtcatg ataataatgg tttcttagac gtcaggtggc acttttcggg 5520
gaaatgtgcg cggaacccct atttgtttat ttttctaaat acattcaaat atgtatccgc 5580

tcatgagaca ataaccctga taaatgcttc aataatattg aaaaaggaag agtatgagta 5640

ttcaacattt ccgtgtcgcc cttattccct tttttgcggc attttgcctt cctgtttttg 5700

ctcacccaga aacgctggtg aaagtaaaag atgctgaaga tcagttgggt gcacgagtgg 5760

gttacatcga actggatctc aacagcggta agatccttga gagttttcgc cccgaagaac 5820

gttttccaat gatgagcact tttaaagttc tgctatgtgg cgcggtatta tcccgtgttg 5880

acgccgggca agagcaactc ggtcgccgca tacactattc tcagaatgac ttggttgagt 5940

actcaccagt cacagaaaag catcttacgg atggcatgac agtaagagaa ttatgcagtg 6000

ctgccataac catgagtgat aacactgcgg ccaacttact tctgacaacg atcggaggac 6060

cgaaggagct aaccgctttt ttgcacaaca tgggggatca tgtaactcgc cttgatcgtt 6120

gggaaccgga gctgaatgaa gccataccaa acgacgagcg tgacaccacg atgcctgcag 6180

caatggcaac aacgttgcgc aaactattaa ctggcgaact acttactcta gcttcccggc 6240

aacaattaat agactggatg gaggcggata aagttgcagg accacttctg cgctcggccc 6300

ttccggctgg ctggtttatt gctgataaat ctggagccgg tgagcgtggg tctcgcggta 6360

tcattgcagc actggggcca gatggtaagc cctcccgtat cgtagttatc tacacgacgg 6420

ggagtcaggc aactatggat gaacgaaata gacagatcgc tgagataggt gcctcactga 6480

ttaagcattg gtaactgtca gaccaagttt actcatatat actttagatt gatttaaatt 6540

gtaaacgtta atattttgtt aaaattcgcg ttaaattttt gttaaatcag ctcatttttt 6600

aaccaatagg ccgaaatcgg caaaatccct tataaatcaa aagaatagac cgagataggg 6660

ttgagtgttg ttccagtttg gaacaagagt ccactattaa agaacgtgga ctccaacgtc 6720

aaagggcgaa aaaccgtcta tcagggcgat ggcccactac gtgaaccatc accctaatca 6780

agtttttgg ggtcgaggtg ccgtaaagca ctaaatcgga accctaaagg gagcccccga 6840

tttagagctt gacggggaaa gccggcgaac gtggcgagaa aggaagggaa gaaagcgaaa 6900

ggagcgggcg ctagggcgct ggcaagtgta gcggtcacgc tgcgcgtaac caccacaccc 6960

gccgcgctta atgcgccgct acagggcgcg taaaaggatc taggtgaaga tccttttga 7020

taatctcatg accaaaatcc cttaacgtga gttttcgttc cactgagcgt cagaccccgt 7080

agaaaagatc aaaggatctt cttgagatcc ttttttttctg cgcgtaatct gctgcttgca 7140

aacaaaaaaa ccaccgctac cagcggtggt ttgtttgccg gatcaagagc taccaactct 7200

ttttccgaag gtaactggct tcagcagagc gcagatacca aatactgtcc ttctagtgta 7260

gccgtagtta ggccaccact tcaagaactc tgtagcaccg cctacatacc tcgctctgct 7320

aatcctgtta ccagtggctg ctgccagtgg cgataagtcg tgtcttaccg ggttggactc 7380
aagacgatag ttaccggata aggcgcagcg gtcgggctga acgggggggtt cgtgcacaca 7440

gcccagcttg gagcgaacga cctacaccga actgagatac ctacagcgtg agcattgaga 7500

aagcgccacg cttcccgaag ggagaaaggc ggacaggtat ccggtaagcg gcagggtcgg 7560

aacaggagag cgcacgaggg agcttccagg gggaaacgcc tggtatcttt atagtcctgt 7620

cgggtttcgc cacctctgac ttgagcgtcg atttttgtga tgctcgtcag gggggcggag 7680

cctatggaaa aacgccagca acgcggcctt tttacggttc ctggcctttt gctggccttt 7740

tgctcacatg ttctttcctg cgttatcccc tgattctgtg gataaccgta ttaccgcctt 7800

tgagtgagct gataccgctc gccgcagccg aacgaccgag cgcagcgagt cagtgagcga 7860

ggaagcggaa gagcgcctga tgcggtattt tctccttacg catctgtgcg gtatttcaca 7920

ccgcatatgg tgcactctca gtacaatctg ctctgatgcc gcatagttaa gccagtatac 7980

actccgctat cgctacgtga ctgggtcatg gctgcgcccc gacacccgcc aacacccgct 8040

gacgcgccct gacgggcttg tctgctcccg gcatccgctt acagacaagc tgtgaccgtc 8100

tccgggagct gcatgtgtca gaggttttca ccgtcatcac cgaaacgcgc gaggcag 8157

<210> 71
<211> 8584
<212> DNA
<213> Artificial Sequence

<220>

<223> Plasmid pHIL-D2 (MFalphaPrePro::EPI-HNE-3)

<400> 71
agatcgcggc cgcgatctaa catccaaaga cgaaaggttg aatgaaacct ttttgccatc 60

cgacatccac aggtccattc tcacacataa gtgccaaacg caacaggagg ggatacacta 120

gcagcagacc gttgcaaacg caggacctcc actcctcttc tcctcaacac ccacttttgc 180

catcgaaaaa ccagcccagt tattgggctt gattggagct cgctcattcc aattccttct 240

attaggctac taacaccatg actttattag cctgtctatc ctggcccccc tggcgaggtc 300

atgtttgttt atttccgaat gcaacaagct ccgcattaca cccgaacatc actccagatg 360

agggctttct gagtgtgggg tcaaatagtt tcatgttccc aaatggccca aaactgacag 420

tttaaacgct gtcttggaac ctaatatgac aaaagcgtga tctcatccaa gatgaactaa 480

gtttggttcg ttgaaatgct aacggccagt tggtcaaaaa gaaacttcca aaagtcgcca 540

taccgtttgt cttgtttggt attgattgac gaatgctcaa aaataatctc attaatgctt 600

agcgcagtct ctctatcgct tctgaacccg gtggcacctg tgccgaaacg caaatgggga 660

aacaacccgc tttttggatg attatgcatt gtcctccaca ttgtatgctt ccaagattct 720

ggtgggaata ctgctgatag cctaacgttc atgatcaaaa tttaactgtt ctaaccccta 780

cttgacaggc aatatataaa cagaaggaag ctgccctgtc ttaaaccttt ttttttatca 840

tcattattag cttactttca taattgcgac tggttccaat tgacaagctt ttgattttaa 900

cgacttttaa cgacaacttg agaagatcaa aaaacaacta attattcgaa acgatgagat 960

tcccatctat cttcactgct gttttgttcg ctgcttcctc tgctttggct gctccagtta 1020

acaccactac tgaagacgag actgctcaaa ttcctgctga ggctgtcatc ggttactctg 1080

acttggaagg tgacttcgac gtcgctgttt tgccattctc taactctact aacaacggtt 1140

tgttgttcat caacactacc atcgcttcta tcgctgctaa ggaggaaggt gtttccttgg 1200

acaagagagc tgcttgtaac ttgccaatcg tcagaggtcc atgcattgct ttcttcccaa 1260

gatgggcttt cgacgctgtt aagggtaagt gcgtcttgtt cccatacggt ggttgtcaag 1320

gtaacggtaa caagttctac tctgagaagg agtgtagaga gtactgtggt gttccatagt 1380

aagaattcgc cttagacatg actgttcctc agttcaagtt gggcattacg agaagaccgg 1440

tcttgctaga ttctaatcaa gaggatgtca gaatgccatt tgcctgagag atgcaggctt 1500

catttttgat actttttttat ttgtaaccta tatagtatag gatttttttt gtcattttgt 1560

ttcttctcgt acgagcttgc tcctgatcag cctatctcgc agctgatgaa tatcttgtgg 1620

taggggtttg ggaaaatcat tcgagtttga tgtttttctt ggtatttccc actcctcttc 1680

agagtacaga agattaagtg agaagttcgt ttgtgcaagc ttatcgataa gctttaatgc 1740

ggtagtttat cacagttaaa ttgctaacgc agtcaggcac cgtgtatgaa atctaacaat 1800

gcgctcatcg tcatcctcgg caccgtcacc ctggatgctg taggcatagg cttggttatg 1860

ccggtactgc cgggcctctt gcgggatatc gtccattccg acagcatcgc cagtcactat 1920

ggcgtgctgc tagcgctata tgcgttgatg caatttctat gcgcacccgt tctcggagca 1980

ctgtccgacc gctttggccg ccgcccagtc ctgctcgctt cgctacttgg agccactatc 2040

gactacgcga tcatggcgac cacacccgtc ctgtggatct atcgaatcta aatgtaagtt 2100

aaaatctcta aataattaaa taagtcccag tttctccata cgaaccttaa cagcattgcg 2160

gtgagcatct agaccttcaa cagcagccag atccatcact gcttggccaa tatgtttcag 2220

tccctcagga gttacgtctt gtgaagtgat gaacttctgg aaggttgcag tgttaactcc 2280

gctgtattga cgggcatatc cgtacgttgg caaagtgtgg ttggtaccgg aggagtaatc 2340

tccacaactc tctggagagt aggcaccaac aaacacagat ccagcgtgtt gtacttgatc 2400

aacataagaa gaagcattct cgatttgcag gatcaagtgt tcaggagcgt actgattgga 2460

catttccaaa gcctgctcgt aggttgcaac cgatagggtt gtagagtgtg caatacactt 2520

gcgtacaatt tcaacccttg gcaactgcac agcttggttg tgaacagcat cttcaattct 2580
ggcaagctcc ttgtctgtca tatcgacagc caacagaatc acctgggaat caataccatg 2640

ttcagcttga gcagaaggtc tgaggcaacg aaatctggat cagcgtattt atcagcaata 2700

actagaactt cagaaggccc agcaggcatg tcaatactac acagggctga tgtgtcattt 2760

tgaaccatca tcttggcagc agtaacgaac tggtttcctg gaccaaatat tttgtcacac 2820

ttaggaacag tttctgttcc gtaagccata gcagctactg cctgggcgcc tcctgctagc 2880

acgatacact tagcaccaac cttgtgggca acgtagatga cttctggggt aagggtacca 2940

tccttcttag gtggagatgc aaaaacaatt tctttgcaac cagcaacttt ggcaggaaca 3000

cccagcatca gggaagtgga aggcagaatt gcggttccac caggaatata gaggccaact 3060

ttctcaatag gtcttgcaaa acgagagcag actacaccag ggcaagtctc aacttgcaac 3120

gtctccgtta gttgagcttc atggaatttc ctgacgttat ctatagagag atcaatggct 3180

ctcttaacgt tatctggcaa ttgcataagt tcctctggga aaggagcttc taacacaggt 3240

gtcttcaaag cgactccatc aaacttggca gttagttcta aaagggcttt gtcaccattt 3300

tgacgaacat tgtcgacaat tggtttgact aattccataa tctgttccgt tttctggata 3360

ggacgacgaa gggcatcttc aatttcttgt gaggaggcct tagaaacgtc aattttgcac 3420

aattcaatac gaccttcaga agggacttct ttaggtttgg attcttcttt aggttgttcc 3480

ttggtgtatc ctggcttggc atctcctttc cttctagtga cctttaggga cttcatatcc 3540

aggtttctct ccacctcgtc caacgtcaca ccgtacttgg cacatctaac taatgcaaaa 3600

taaaataagt cagcacattc ccaggctata tcttccttgg atttagcttc tgcaagttca 3660

tcagcttcct ccctaatttt agcgttcaac aaaacttcgt cgtcaaataa ccgtttggta 3720

taagaacctt ctggagcatt gctcttacga tcccacaagg tgcttccatg gctctaagac 3780

cctttgattg gccaaaacag gaagtgcgtt ccaagtgaca gaaaccaaca cctgtttgtt 3840

caaccacaaa tttcaagcag tctccatcac aatccaattc gatacccagc aacttttgag 3900

ttcgtccaga tgtagcacct ttataccaca aaccgtgacg acgagattgg tagactccag 3960

tttgtgtcct tatagcctcc ggaatagact ttttggacga gtacaccagg cccaacgagt 4020

aattagaaga gtcagccacc aaagtagtga atagaccatc ggggcggtca gtagtcaaag 4080

acgccaacaa aatttcactg acagggaact ttttgacatc ttcagaaagt tcgtattcag 4140

tagtcaattg ccgagcatca ataatgggga ttataccaga agcaacagtg gaagtcacat 4200

ctaccaactt tgcggtctca gaaaaagcat aaacagttct actaccgcca ttagtgaaac 4260

ttttcaaatc gcccagtgga gaagaaaaag gcacagcgat actagcatta gcgggcaagg 4320

atgcaacttt atcaaccagg gtcctataga taaccctagc gcctgggatc atcctttgga 4380

caactctttc tgccaaatct aggtccaaaa tcacttcatt gataccatta tacggatgac 4440
tcaacttgca cattaacttg aagctcagtc gattgagtga acttgatcag gttgtgcagc 4500

tggtcagcag catagggaaa cacggctttt cctaccaaac tcaaggaatt atcaaactct 4560

gcaacacttg cgtatgcagg tagcaaggga aatgtcatac ttgaagtcgg acagtgagtg 4620

tagtcttgag aaattctgaa gccgtatttt tattatcagt gagtcagtca tcaggagatc 4680

ctctacgccg gacgcatcgt ggccggcatc accggcgcca caggtgcggt tgctggcgcc 4740

tatatcgccg acatcaccga tggggaagat cgggctcgcc acttcgggct catgagcgct 4800

tgtttcggcg tgggtatggt ggcaggcccc gtggccgggg gactgttggg cgccatctcc 4860

ttgcatgcac cattccttgc ggcggcggtg ctcaacggcc tcaacctact actgggctgc 4920

ttcctaatgc aggagtcgca taagggagag cgtcgagtat ctatgattgg aagtatggga 4980

atggtgatac ccgcattctt cagtgtcttg aggtctccta tcagattatg cccaactaaa 5040

gcaaccggag gaggagattt catggtaaat ttctctgact tttggtcatc agtagactcg 5100

aactgtgaga ctatctcggt tatgacagca gaaatgtcct tcttggagac agtaaatgaa 5160

gtcccaccaa taaagaaatc cttgttatca ggaacaaact tcttgtttcg aacttttcg 5220

gtgccttgaa ctataaaatg tagagtggat atgtcgggta ggaatggagc gggcaaatgc 5280

ttaccttctg gaccttcaag aggtatgtag ggtttgtaga tactgatgcc aacttcagtg 5340

acaacgttgc tatttcgttc aaaccattcc gaatccagag aaatcaaagt tgtttgtcta 5400

ctattgatcc aagccagtgc ggtcttgaaa ctgacaatag tgtgctcgtg ttttgaggtc 5460

atctttgtat gaataaatct agtctttgat ctaaataatc ttgacgagcc aaggcgataa 5520

atacccaaat ctaaaactct tttaaaacgt taaaaggaca agtatgtctg cctgtattaa 5580

accccaaatc agctcgtagt ctgatcctca tcaacttgag gggcactatc ttgttttaga 5640

gaaatttgcg gagatgcgat atcgagaaaa aggtacgctg attttaaacg tgaaatttat 5700

ctcaagatcg cggccgcgat ctcgaataat aactgttatt tttcagtgtt cccgatctgc 5760

gtctatttca caataccaac atgagtcagc ttatcgatga taagctgtca aacatgagaa 5820

ttaattcgat gataagctgt caaacatgag aaatcttgaa gacgaaaggg cctcgtgata 5880

cgcctatttt tataggttaa tgtcatgata ataatggttt cttagacgtc aggtggcact 5940

tttcggggaa atgtgcgcgg aacccctatt tgtttatttt tctaaataca ttcaaatatg 6000

tatccgctca tgagacaata accctgataa atgcttcaat aatattgaaa aaggaagagt 6060

atgagtattc aacatttccg tgtcgccctt attccctttt ttgcggcatt ttgccttcct 6120

gtttttgctc acccagaaac gctggtgaaa gtaaaagatg ctgaagatca gttgggtgca 6180

cgagtgggtt acatcgaact ggatctcaac agcggtaaga tccttgagag ttttcgcccc 6240

gaagaacgtt ttccaatgat gagcactttt aaagttctgc tatgtggcgc ggtattatcc 6300
cgtgttgacg ccgggcaaga gcaactcggt cgccgcatac actattctca gaatgacttg 6360

gttgagtact caccagtcac agaaaagcat cttacggatg gcatgacagt aagagaatta 6420

tgcagtgctg ccataaccat gagtgataac actgcggcca acttacttct gacaacgatc 6480

ggaggaccga aggagctaac cgcttttttg cacaacatgg gggatcatgt aactcgcctt 6540

gatcgttggg aaccggagct gaatgaagcc ataccaaacg acgagcgtga caccacgatg 6600

cctgcagcaa tggcaacaac gttgcgcaaa ctattaactg gcgaactact tactctagct 6660

tcccggcaac aattaataga ctggatggag gcggataaag ttgcaggacc acttctgcgc 6720

tcggcccttc cggctggctg gtttattgct gataaatctg gagccggtga gcgtgggtct 6780

cgcggtatca ttgcagcact ggggccagat ggtaagccct cccgtatcgt agttatctac 6840

acgacgggga gtcaggcaac tatggatgaa cgaaatagac agatcgctga gataggtgcc 6900

tcactgatta agcattggta actgtcagac caagtttact catatatact ttagattgat 6960

ttaaattgta aacgttaata ttttgttaaa attcgcgtta aatttttgtt aaatcagctc 7020

atttttaac caataggccg aaatcggcaa aatcccttat aaatcaaaag aatagaccga 7080

gatagggttg agtgttgttc cagtttggaa caagagtcca ctattaaaga acgtggactc 7140

caacgtcaaa gggcgaaaaa ccgtctatca gggcgatggc ccactacgtg aaccatcacc 7200

ctaatcaagt tttttggggt cgaggtgccg taaagcacta aatcggaacc ctaaagggag 7260

cccccgattt agagcttgac ggggaaagcc ggcgaacgtg gcgagaaagg aagggaagaa 7320

agcgaaagga gcgggcgcta gggcgctggc aagtgtagcg gtcacgctgc gcgtaaccac 7380

cacacccgcc gcgcttaatg cgccgctaca gggcgcgtaa aaggatctag gtgaagatcc 7440

tttttgataa tctcatgacc aaaatccctt aacgtgagtt ttcgttccac tgagcgtcag 7500

accccgtaga aaagatcaaa ggatcttctt gagatccttt ttttctgcgc gtaatctgct 7560

gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg tttgccggat caagagctac 7620

caactctttt tccgaaggta actggcttca gcagagcgca gataccaaat actgtccttc 7680

tagtgtagcc gtagttaggc caccacttca agaactctgt agcaccgcct acatacctcg 7740

ctctgctaat cctgttacca gtggctgctg ccagtggcga taagtcgtgt cttaccgggt 7800

tggactcaag acgatagtta ccggataagg cgcagcggtc gggctgaacg gggggttcgt 7860

gcacacagcc cagcttggag cgaacgacct acaccgaact gagataccta cagcgtgagc 7920

attgagaaag cgccacgctt cccgaaggga gaaaggcgga caggtatccg gtaagcggca 7980

gggtcggaac aggagagcgc acgagggagc ttccaggggg aaacgcctgg tatctttata 8040

gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt tttgtgatgc tcgtcagggg 8100

ggcggagcct atggaaaaac gccagcaacg cggccttttt acggttcctg gccttttgct 8160
ggcctttgc tcacatgttc tttcctgcgt tatcccctga ttctgtggat aaccgtatta 8220

ccgcctttga gtgagctgat accgctcgcc gcagccgaac gaccgagcgc agcgagtcag 8280

tgagcgagga agcggaagag cgcctgatgc ggtattttct ccttacgcat ctgtgcggta 8340

tttcacaccg catatggtgc actctcagta caatctgctc tgatgccgca tagttaagcc 8400

agtatacact ccgctatcgc tacgtgactg ggtcatggct gcgccccgac acccgccaac 8460

acccgctgac gcgccctgac gggcttgtct gctcccggca tccgcttaca gacaagctgt 8520

gaccgtctcc gggagctgca tgtgtcagag gttttcaccg tcatcaccga aacgcgcgag 8580

gcag 8584

<210> 72
<211> 141
<212> PRT
<213> Artificial Sequence

<220>

<223> Plasmid pHIL-D2 (MFalphaPrePro::EPI-HNE-3)

<400> 72

Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1 5 10 15

Ala Leu Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Ser Asp Leu Glu Gly Asp Phe
35 40 45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
50 55 60

```
Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val
65                  70                  75                  80

Ser Leu Asp Lys Arg Ala Ala Cys Asn Leu Pro Ile Val Arg Gly Pro
                85                  90                  95

Cys Ile Ala Phe Phe Pro Arg Trp Ala Phe Asp Ala Val Lys Gly Lys
            100                 105                 110

Cys Val Leu Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe
        115                 120                 125

Tyr Ser Glu Lys Glu Cys Arg Glu Tyr Cys Gly Val Pro
    130                 135                 140
```

<210> 73
<211> 444
<212> DNA
<213> Artificial Sequence

<220>

<223> BstBI-AatII-EcoRI cassette for expression of Epi-HNE-4

<400> 73

```
ttcgaaacga tgagattccc atctatcttc actgctgttt tgttcgctgc ttcctctgct     60

ttggctgctc cagttaacac cactactgaa gacgagactg ctcaaattcc tgctgaggct    120

gtcatcggtt actctgactt ggaaggtgac ttcgacgtcg ctgttttgcc attctctaac    180

tctactaaca acggtttgtt gttcatcaac actaccatcg cttctatcgc tgctaaggag    240

gaaggtgttt ccttggacaa gagagaggct tgtaacttgc caatcgtcag aggtccatgc    300

attgctttct tcccaagatg ggctttcgac gctgttaagg gtaagtgcgt cttgttccca    360

tacggtggtt gtcaaggtaa cggtaacaag ttctactctg agaaggagtg tagagagtac    420

tgtggtgttc catagtaaga attc                                           444
```

<210> 74
<211> 141
<212> PRT
<213> Artificial Sequence

<220>

<223> BstBI-AatII-EcoRI cassette for expression of Epi-HNE-4

<400> 74

```
Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1               5                   10                  15

Ala Leu Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
```

```
            20                  25                  30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Ser Asp Leu Glu Gly Asp Phe
        35                  40                  45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val
65                  70                  75                  80

Ser Leu Asp Lys Arg Glu Ala Cys Asn Leu Pro Ile Val Arg Gly Pro
                85                  90                  95

Cys Ile Ala Phe Phe Pro Arg Trp Ala Phe Asp Ala Val Lys Gly Lys
            100                 105                 110

Cys Val Leu Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe
        115                 120                 125

Tyr Ser Glu Lys Glu Cys Arg Glu Tyr Cys Gly Val Pro
    130                 135                 140
```

<210> 75
<211> 8590
<212> DNA
<213> Artificial Sequence

<220>

<223> pD2pick (MFalphaPrePro::EPI-NHE-3) circular dsDNA

<400> 75

```
agatcgcggc cgcgatctaa catccaaaga cgaaaggttg aatgaaacct ttttgccatc     60

cgacatccac aggtccattc tcacacataa gtgccaaacg caacaggagg ggatacacta    120

gcagcagacc gttgcaaacg caggacctcc actcctcttc tcctcaacac ccacttttgc    180

catcgaaaaa ccagcccagt tattgggctt gattggagct cgctcattcc aattccttct    240

attaggctac taacaccatg actttattag cctgtctatc ctggcccccc tggcgaggtc    300

atgtttgttt atttccgaat gcaacaagct ccgcattaca cccgaacatc actccagatg    360

agggctttct gagtgtgggg tcaaatagtt tcatgttccc aaatggccca aaactgacag    420

tttaaacgct gtcttggaac ctaatatgac aaaagcgtga tctcatccaa gatgaactaa    480

gtttggttcg ttgaaatgct aacggccagt tggtcaaaaa gaaacttcca aaagtcgcca    540

taccgtttgt cttgtttggt attgattgac gaatgctcaa aaataatctc attaatgctt    600

agcgcagtct ctctatcgct tctgaacccg gtggcacctg tgccgaaacg caaatgggga    660

aacaacccgc tttttggatg attatgcatt gtcctccaca ttgtatgctt ccaagattct    720

ggtgggaata ctgctgatag cctaacgttc atgatcaaaa tttaactgtt ctaaccccta    780

cttgacaggc aatatataaa cagaaggaag ctgccctgtc ttaaaccttt ttttttatca    840
```

tcattattag cttactttca taattgcgac tggttccaat tgacaagctt ttgattttaa 900

cgacttttaa cgacaacttg agaagatcaa aaaacaacta attattcgaa acgatgagat 960

tcccatctat cttcactgct gttttgttcg ctgcttcctc tgctttggct gctccagtta 1020

acaccactac tgaagacgag actgctcaaa ttcctgctga ggctgtcatc ggttactctg 1080

acttggaagg tgacttcgac gtcgctgttt tgccattctc taactctact aacaacggtt 1140

tgttgttcat caacactacc atcgcttcta tcgctgctaa ggaggaaggt gtttccttgg 1200

acaagagagc tgcttgtaac ttgccaatcg tcagaggtcc atgcattgct ttcttcccaa 1260

gatgggcttt cgacgctgtt aagggtaagt gcgtcttgtt cccatacggt ggttgtcaag 1320

gtaacggtaa caagttctac tctgagaagg agtgtagaga gtactgtggt gttccatagt 1380

aagaattcgc cttagacatg actgttcctc agttcaagtt gggcattacg agaagaccgg 1440

tcttgctaga ttctaatcaa gaggatgtca gaatgccatt tgcctgagag atgcaggctt 1500

cattttgat actttttat ttgtaaccta tatagtatag gatttttttt gtcattttgt 1560
ttcttctcgt acgagcttgc tcctgatcag cctatctcgc agctgatgaa tatcttgtgg 1620

taggggtttg ggaaaatcat tcgagtttga tgtttttctt ggtatttccc actcctcttc 1680

agagtacaga agattaagtg agaagttcgt ttgtgcaagc ttatcgataa gctttaatgc 1740

ggtagtttat cacagttaaa ttgctaacgc agtcaggcac cgtgtatgaa atctaacaat 1800

gcgctcatcg tcatcctcgg caccgtcacc ctggatgctg taggcatagg cttggttatg 1860

ccggtactgc cgggcctctt gcgggatatc gtccattccg acagcatcgc cagtcactat 1920

ggcgtgctgc tagcgctata tgcgttgatg caatttctat gcgcacccgt tctcggagca 1980

ctgtccgacc gctttggccg ccgcccagtc ctgctcgctt cgctacttgg agccactatc 2040

gactacgcga tcatggcgac cacacccgtc ctgtggatct atcgaatcta aatgtaagtt 2100

aaaatctcta aataattaaa taagtcccag tttctccata cgaaccttaa cagcattgcg 2160

gtgagcatct agaccttcaa cagcagccag atccatcact gcttggccaa tatgtttcag 2220

tccctcagga gttacgtctt gtgaagtgat gaacttctgg aaggttgcag tgttaactcc 2280

gctgtattga cgggcatatc cgtacgttgg caaagtgtgg ttggtaccgg aggagtaatc 2340

tccacaactc tctggagagt aggcaccaac aaacacagat ccagcgtgtt gtacttgatc 2400

aacataagaa gaagcattct cgatttgcag gatcaagtgt tcaggagcgt actgattgga 2460

catttccaaa gcctgctcgt aggttgcaac cgatagggtt gtagagtgtg caatacactt 2520

gcgtacaatt tcaacccttg gcaactgcac agcttggttg tgaacagcat cttcaattct 2580

ggcaagctcc ttgtctgtca tatcgacagc caacagaatc acctgggaat caataccatg 2640

ttcagcttga gcagaaggtc tgaggcaacg aaatctggat cagcgtattt atcagcaata 2700

actagaactt cagaaggccc agcaggcatg tcaatactac acagggctga tgtgtcattt 2760

tgaaccatca tcttggcagc agtaacgaac tggtttcctg gaccaaatat tttgtcacac 2820

ttaggaacag tttctgttcc gtaagccata gcagctactg cctgggcgcc tcctgctagc 2880

acgatacact tagcaccaac cttgtgggca acgtagatga cttctggggt aagggtacca 2940

tccttcttag gtggagatgc aaaaacaatt tctttgcaac cagcaacttt ggcaggaaca 3000

cccagcatca gggaagtgga aggcagaatt gcggttccac caggaatata gaggccaact 3060

ttctcaatag gtcttgcaaa acgagagcag actacaccag ggcaagtctc aacttgcaac 3120

gtctccgtta gttgagcttc atggaatttc ctgacgttat ctatagagag atcaatggct 3180

ctcttaacgt tatctggcaa ttgcataagt tcctctggga aaggagcttc taacacaggt 3240

gtcttcaaag cgactccatc aaacttggca gttagttcta aaagggcttt gtcaccattt 3300

tgacgaacat tgtcgacaat tggtttgact aattccataa tctgttccgt tttctggata 3360

ggacgacgaa gggcatcttc aatttcttgt gaggaggcct tagaaacgtc aattttgcac 3420
aattcaatac gaccttcaga agggacttct ttaggtttgg attcttcttt aggttgttcc 3480

ttggtgtatc ctggcttggc atctcctttc cttctagtga cctttaggga cttcatatcc 3540

aggtttctct ccacctcgtc caacgtcaca ccgtacttgg cacatctaac taatgcaaaa 3600

taaaataagt cagcacattc ccaggctata tcttccttgg atttagcttc tgcaagttca 3660

tcagcttcct ccctaatttt agcgttcaac aaaacttcgt cgtcaaataa ccgtttggta 3720

taagaacctt ctggagcatt gctcttacga tcccacaagg tgcttccatg gctctaagac 3780

cctttgattg gccaaaacag gaagtgcgtt ccaagtgaca gaaaccaaca cctgtttgtt 3840

caaccacaaa tttcaagcag tctccatcac aatccaattc gatacccagc aacttttgag 3900

ttcgtccaga tgtagcacct ttataccaca aaccgtgacg acgagattgg tagactccag 3960

tttgtgtcct tatagcctcc ggaatagact ttttggacga gtacaccagg cccaacgagt 4020

aattagaaga gtcagccacc aaagtagtga atagaccatc ggggcggtca gtagtcaaag 4080

acgccaacaa aatttcactg acagggaact ttttgacatc ttcagaaagt tcgtattcag 4140

tagtcaattg ccgagcatca ataatgggga ttataccaga agcaacagtg gaagtcacat 4200

ctaccaactt tgcggtctca gaaaaagcat aaacagttct actaccgcca ttagtgaaac 4260

ttttcaaatc gcccagtgga gaagaaaaag gcacagcgat actagcatta gcgggcaagg 4320

atgcaacttt atcaaccagg gtcctataga taaccctagc gcctgggatc atcctttgga 4380

caactctttc tgccaaatct aggtccaaaa tcacttcatt gataccatta tacggatgac 4440

tcaacttgca cattaacttg aagctcagtc gattgagtga acttgatcag gttgtgcagc 4500

tggtcagcag catagggaaa cacggctttt cctaccaaac tcaaggaatt atcaaactct 4560

gcaacacttg cgtatgcagg tagcaaggga aatgtcatac ttgaagtcgg acagtgagtg 4620

tagtcttgag aaattctgaa gccgtatttt tattatcagt gagtcagtca tcaggagatc 4680

ctctacgccg gacgcatcgt ggccggcatc accggcgcca caggtgcggt tgctggcgcc 4740

tatatcgccg acatcaccga tggggaagat cgggctcgcc acttcgggct catgagcgct 4800

tgtttcggcg tgggtatggt ggcaggcccc gtggccgggg gactgttggg cgccatctcc 4860

ttgcatgcac cattccttgc ggcggcggtg ctcaacggcc tcaacctact actgggctgc 4920

ttcctaatgc aggagtcgca taagggagag cgtcgagtat ctatgattgg aagtatggga 4980

atggtgatac ccgcattctt cagtgtcttg aggtctccta tcagattatg cccaactaaa 5040

gcaaccggag gaggagattt catggtaaat ttctctgact tttggtcatc agtagactcg 5100

aactgtgaga ctatctcggt tatgacagca gaaatgtcct tcttggagac agtaaatgaa 5160

gtcccaccaa taaagaaatc cttgttatca ggaacaaact tcttgtttcg cgaacttttt 5220

cggtgccttg aactataaaa tgtagagtgg atatgtcggg taggaatgga gcgggcaaat 5280
gcttaccttc tggaccttca agaggtatgt agggtttgta gatactgatg ccaacttcag 5340

tgacaacgtt gctatttcgt tcaaaccatt ccgaatccag agaaatcaaa gttgtttgtc 5400

tactattgat ccaagccagt gcggtcttga aactgacaat agtgtgctcg tgttttgagg 5460

tcatctttgt atgaataaat ctagtctttg atctaaataa tcttgacgag ccaaggcgat 5520

aaatacccaa atctaaaact cttttaaaac gttaaaagga caagtatgtc tgcctgtatt 5580

aaaccccaaa tcagctcgta gtctgatcct catcaacttg aggggcacta tcttgtttta 5640

gagaaatttg cggagatgcg atatcgagaa aaaggtacgc tgattttaaa cgtgaaattt 5700

atctcaagat cgcggccgcg atctcgaata ataactgtta tttttcagtg ttcccgatct 5760

gcgtctattt cacaatacca acatgagtca gcttatcgat gataagctgt caaacatgag 5820

aattaattcg atgataagct gtcaaacatg agaaatcttg aagacgaaag ggcctcgtga 5880

tacgcctatt tttataggtt aatgtcatga taataatggt ttcttagacg tacgtcaggt 5940

ggcacttttc ggggaaatgt gcgcggaacc cctatttgtt tatttttcta aatacattca 6000

aatatgtatc cgctcatgag acaataaccc tgataaatgc ttcaataata ttgaaaaagg 6060

aagagtatga gtattcaaca tttccgtgtc gcccttattc cctttttgc ggcattttgc 6120

cttcctgttt ttgctcaccc agaaacgctg gtgaaagtaa aagatgctga agatcagttg 6180

ggtgcacgag tgggttacat cgaactggat ctcaacagcg gtaagatcct tgagagtttt 6240

cgccccgaag aacgttttcc aatgatgagc acttttaaag ttctgctatg tggcgcggta 6300

ttatcccgtg ttgacgccgg gcaagagcaa ctcggtcgcc gcatacacta ttctcagaat 6360

gacttggttg agtactcacc agtcacagaa aagcatctta cggatggcat gacagtaaga 6420

gaattatgca gtgctgccat aaccatgagt gataacactg cggccaactt acttctgaca 6480

acgatcggag gaccgaagga gctaaccgct tttttgcaca acatggggga tcatgtaact 6540

cgccttgatc gttgggaacc ggagctgaat gaagccatac caaacgacga gcgtgacacc 6600

acgatgcctg cagcaatggc aacaacgttg cgcaaactat taactggcga actacttact 6660

ctagcttccc ggcaacaatt aatagactgg atggaggcgg ataaagttgc aggaccactt 6720

ctgcgctcgg cccttccggc tggctggttt attgctgata aatctggagc cggtgagcgt 6780

gggtctcgcg gtatcattgc agcactgggg ccagatggta agccctcccg tatcgtagtt 6840

atctacacga cggggagtca ggcaactatg gatgaacgaa atagacagat cgctgagata 6900

ggtgcctcac tgattaagca ttggtaactg tcagaccaag tttactcata tatactttag 6960

attgatttaa attgtaaacg ttaatatttt gttaaaattc gcgttaaatt tttgttaaat 7020

cagctcattt tttaaccaat aggccgaaat cggcaaaatc ccttataaat caaaagaata 7080

gaccgagata gggttgagtg ttgttccagt ttggaacaag agtccactat taaagaacgt 7140
ggactccaac gtcaaagggc gaaaaaccgt ctatcagggc gatggcccac tacgtgaacc 7200

atcaccctaa tcaagttttt tggggtcgag gtgccgtaaa gcactaaatc ggaaccctaa 7260

agggagcccc cgatttagag cttgacgggg aaagccggcg aacgtggcga gaaaggaagg 7320

gaagaaagcg aaaggagcgg gcgctagggc gctggcaagt gtagcggtca cgctgcgcgt 7380

aaccaccaca cccgccgcgc ttaatgcgcc gctacagggc gcgtaaaagg atctaggtga 7440

agatcctttt tgataatctc atgaccaaaa tcccttaacg tgagttttcg ttccactgag 7500

cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga tccttttttt ctgcgcgtaa 7560

tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg ccggatcaag 7620

agctaccaac tctttttccg aaggtaactg gcttcagcag agcgcagata ccaaatactg 7680

tccttctagt gtagccgtag ttaggccacc acttcaagaa ctctgtagca ccgcctacat 7740

acctcgctct gctaatcctg ttaccagtgg ctgctgccag tggcgataag tcgtgtctta 7800

ccgggttgga ctcaagacga tagttaccgg ataaggcgca gcggtcgggc tgaacggggg 7860

gttcgtgcac acagcccagc ttggagcgaa cgacctacac cgaactgaga tacctacagc 7920

gtgagcattg agaaagcgcc acgcttcccg aagggagaaa ggcggacagg tatccggtaa 7980

gcggcagggt cggaacagga gagcgcacga gggagcttcc agggggaaac gcctggtatc 8040

tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg tgatgctcgt 8100

caggggggcg gagcctatgg aaaaacgcca gcaacgcggc ctttttacgg ttcctggcct 8160

tttgctggcc ttttgctcac atgttctttc ctgcgttatc ccctgattct gtggataacc 8220

gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc gagcgcagcg 8280

agtcagtgag cgaggaagcg gaagagcgcc tgatgcggta ttttctcctt acgcatctgt 8340

gcggtatttc acaccgcata tggtgcactc tcagtacaat ctgctctgat gccgcatagt 8400

taagccagta tacactccgc tatcgctacg tgactgggtc atggctgcgc cccgacaccc 8460

gccaacaccc gctgacgcgc cctgacgggc ttgtctgctc ccggcatccg cttacagaca 8520

agctgtgacc gtctccggga gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg 8580

cgcgaggcag 8590

<210> 76
<211> 141
<212> PRT
<213> Artificial Sequence

<220>

<223> EPI-HNE-3 fusion protein

<400> 76

Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1 5 10 15

Ala Leu Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Ser Asp Leu Glu Gly Asp Phe
35 40 45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
50 55 60

Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val
65 70 75 80

Ser Leu Asp Lys Arg Ala Ala Cys Asn Leu Pro Ile Val Arg Gly Pro
85 90 95

Cys Ile Ala Phe Phe Pro Arg Trp Ala Phe Asp Ala Val Lys Gly Lys
100 105 110

Cys Val Leu Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe
115 120 125

Tyr Ser Glu Lys Glu Cys Arg Glu Tyr Cys Gly Val Pro
130 135 140

<210> 77
<211> 147
<212> PRT
<213> Homo sapiens

<400> 77

```
Ala Val Leu Pro Gln Glu Glu Glu Gly Ser Gly Gly Gly Gln Leu Val
1               5                  10                  15

Thr Glu Val Thr Lys Lys Glu Asp Ser Cys Gln Leu Gly Tyr Ser Ala
            20                  25                  30

Gly Pro Cys Met Gly Met Thr Ser Arg Tyr Phe Tyr Asn Gly Thr Ser
        35                  40                  45

Met Ala Cys Glu Thr Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn
    50                  55                  60

Asn Phe Val Thr Glu Lys Glu Cys Leu Gln Thr Cys Arg Thr Val Ala
65                  70                  75                  80

Ala Cys Asn Leu Pro Ile Val Arg Gly Pro Cys Arg Ala Phe Ile Gln
                85                  90                  95

Leu Trp Ala Phe Asp Ala Val Lys Gly Lys Cys Val Leu Phe Pro Tyr
            100                 105                 110

Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe Tyr Ser Glu Lys Glu Cys
        115                 120                 125
Arg Glu Tyr Cys Gly Val Pro Gly Asp Gly Asp Glu Glu Leu Leu Arg
    130                 135                 140

Phe Ser Asn
145
```

<210> 78
<211> 249
<212> DNA
<213> Artificial Sequence

<220>

<223> M13_III_signal::Human_LACI-D2::mature_M13_III

<400> 78

```
atgaagaagc ttctcttcgc cattcctctg gtggtacctt tctattccgg cgccaagcct     60

gacttctgct tcctcgagga ggatcccggg atttgccgcg gttatattac gcgttatttc    120

tataataacc agactaagca atgtgagcgg ttcaagtatg gtggttgcct aggtaatatg    180

aacaacttcg agactctaga agagtgtaag aacatatgtg aggatggtgg tgctgagact    240

gttgagtct                                                            249
```

<210> 79
<211> 83
<212> PRT
<213> Artificial Sequence

<220>

<223> LACI-D2 fusion protein

<400> 79

Met Lys Lys Leu Leu Phe Ala Ile Pro Leu Val Val Pro Phe Tyr Ser
1 5 10 15

Gly Ala Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp Pro Gly Ile Cys
20 25 30

Arg Gly Tyr Ile Thr Arg Tyr Phe Tyr Asn Asn Gln Thr Lys Gln Cys
35 40 45

Glu Arg Phe Lys Tyr Gly Gly Cys Leu Gly Asn Met Asn Asn Phe Glu
50 55 60

Thr Leu Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly Gly Ala Glu Thr
65 70 75 80

Val Glu Ser

<210> 80
<211> 189
<212> DNA
<213> Artificial Sequence

<220>

<223> laci-d1 with cloning sites

<400> 80
gcggccgaga tgcattcctt ctgcgctttc aaagctgatg acggtccgtg taaagctatc 60

atgaaacgtt tcttcttcaa cattttcacg cgtcagtgcg aggaattcat ttacggtggt 120

tgtgaaggta accagaaccg gttcgaatct ctagaggaat gtaagaagat gtgcactcgt 180

gacggcgcc 189

<210> 81
<211> 63
<212> PRT
<213> Artificial Sequence

<220>

<223> laci-d1 with linkers

<400> 81

Ala Ala Glu Met His Ser Phe Cys Ala Phe Lys Ala Asp Asp Gly Pro
1 5 10 15

Cys Lys Ala Ile Met Lys Arg Phe Phe Phe Asn Ile Phe Thr Arg Gln
20 25 30

Cys Glu Glu Phe Ile Tyr Gly Gly Cys Glu Gly Asn Gln Asn Arg Phe
35 40 45

Glu Ser Leu Glu Glu Cys Lys Lys Met Cys Thr Arg Asp Gly Ala

50 55 60

<210> 82
<211> 189
<212> DNA
<213> Artificial sequence

<220>

<223> LACI-D1 hNE library

<220>
<221> misc_feature
<222> (37)..(37)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (38)..(38)
<223> n is a or g

<220>
<221> misc_feature
<222> (40)..(40)
<223> n is a or g

<220>
<221> misc_feature
<222> (41)..(41)
<223> n is a, c or g

<220>
<221> misc_feature
<222> (42)..(42)
<223> n is c or g

<220>
<221> misc_feature
<222> (47)..(47)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (52)..(52)
<223> n is a or g

<220>
<221> misc_feature
<222> (56)..(56)
<223> n is c or g

<220>
<221> misc_feature
<222> (58)..(58)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (64)..(64)
<223> n is a or c

<220>
<221> misc_feature
<222> (65)..(65)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (66)..(66)
<223> n is c or g

<220>
<221> misc_feature
<222> (71)..(71)
<223> n is a, g or t

<220>
<221> misc_feature
<222> (72)..(72)
<223> n is c or g

<220>
<221> misc_feature
<222> (100)..(100)
<223> n is c or g

<220>
<221> misc_feature
<222> (101)..(101)
<223> n is a or t

<220>
<221> misc_feature
<222> (103)..(103)
<223> n is a, c or g

<220>
<221> misc_feature
<222> (104)..(104)
<223> n is a, c or t

<220>
<221> misc_feature
<222> (109)..(109)
<223> n is a, c or g

<220>
<221> misc_feature
<222> (110)..(110)
<223> n is a, c or t

<220>
<221> misc_feature
<222> (124)..(124)
<223> n is a, c or g

<220>
<221> misc_feature
<222> (125)..(125)
<223> n is a, c or t

<220>
<221> misc_feature
<222> (128)..(128)
<223> n is c or g

<220>
<221> misc_feature
<222> (133)..(133)
<223> n is c or g

<220>
<221> misc_feature
<222> (134)..(134)
<223> n is a or g

<400> 82
gcggccgaga tgcattcctt ctgcgctttc aaagctnntn nnggtcnttg tnttgntntc 60

ttcnnncgtt nnttcttcaa cattttcacg cgtcagtgcn ngnnattcnn atacggtggt 120

tgtnnggnta acnngaaccg gttcgaatct ctagaggaat gtaagaagat gtgcactcgt 180

gacggcgcc 189

<210> 83
<211> 63
<212> PRT
<213> Artificial Sequence

<220>

<223> LACI-D1 hNE library

<220>
<221> misc_feature
<222> (13)..(13)
<223> Xaa is Cys, Arg, Ser, Gly, Tyr, His, Asp or Asn

<220>
<221> misc_feature
<222> (14)..(14)
<223> Xaa is Thr, Asn, Lys, Arg, Ser, Ala, Glu, Gly or Asp

<220>
<221> misc_feature
<222> (16)..(16)
<223> Xaa is His, Arg, Pro or Leu

<220>
<221> misc_feature
<222> (18)..(18)
<223> Xaa is Val or Ile

<220>
<221> misc_feature
<222> (19)..(19)
<223> Xaa is Ala or Gly

<220>

<221> misc_feature
<222> (20)..(20)
<223> Xaa is Phe, Leu, Ile or Val

<220>
<221> misc_feature
<222> (22)..(22)
<223> Xaa is Ser, Thr, Asn, Ile, Met, Gln, His, Leu, Pro, Lys or Arg

<220>
<221> misc_feature
<222> (24)..(24)
<223> Xaa is Cys, Tyr, Trp, Phe or Leu

<220>
<221> misc_feature
<222> (34)..(34)
<223> Xaa is Leu, Gln, Glu or Val

<220>
<221> misc_feature
<222> (35)..(35)
<223> Xaa is Gln, Leu, Pro, Thr, Lys, Val, Ile, Glu or Ala

<220>
<221> misc_feature
<222> (37)..(37)
<223> Xaa is Gln, Leu, Pro, Thr, Lys, Val, Glu, Ile or Ala

<220>
<221> misc_feature
<222> (42)..(42)
<223> Xaa is Gln, Leu, Pro, Thr, Lys, Val, Met, Glu or Ala

<220>
<221> misc_feature
<222> (43)..(43)
<223> Xaa is Gly or Ala

<220>
<221> misc_feature
<222> (45)..(45)
<223> Xaa is Glu, Gly, Gln or Arg

<400> 83

```
Ala Ala Glu Met His Ser Phe Cys Ala Phe Lys Ala Xaa Xaa Gly Xaa
1               5                  10                  15

Cys Xaa Xaa Xaa Phe Xaa Arg Xaa Phe Phe Asn Ile Phe Thr Arg Gln
            20                  25                  30

Cys Xaa Xaa Phe Xaa Tyr Gly Gly Cys Xaa Xaa Asn Xaa Asn Arg Phe
        35                  40                  45

Glu Ser Leu Glu Glu Cys Lys Lys Met Cys Thr Arg Asp Gly Ala
    50                  55                  60
```

<210> 84
<211> 201

<212> DNA
<213> Artificial sequence

<220>

<223> LACI-D2 hNE library

<220>
<221> misc_feature
<222> (34)..(34)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (35)..(35)
<223> n is a or g

<220>
<221> misc_feature
<222> (37)..(38)
<223> n is a, c or g

<220>
<221> misc_feature
<222> (39)..(39)
<223> n is c or g
<220>
<221> misc_feature
<222> (43)..(43)
<223> n is a or c

<220>
<221> misc_feature
<222> (44)..(44)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (49)..(49)
<223> n is a or g

<220>
<221> misc_feature
<222> (53)..(53)
<223> n is c or g

<220>
<221> misc_feature
<222> (55)..(55)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (56)..(56)
<223> n is a or t

<220>
<221> misc_feature
<222> (61)..(61)
<223> n is a or c

<220>
<221> misc_feature
<222> (62)..(62)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (63)..(63)
<223> n is c or g

<220>
<221> misc_feature
<222> (68)..(68)
<223> n is a, g or t

<220>
<221> misc_feature
<222> (69)..(69)
<223> n is c or g

<220>
<221> misc_feature
<222> (97)..(97)
<223> n is c or g

<220>
<221> misc_feature
<222> (98)..(98)
<223> n is a or t

<220>
<221> misc_feature
<222> (100)..(100)
<223> n is a, c or g

<220>
<221> misc_feature
<222> (101)..(101)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (106)..(106)
<223> n is a, c, or g

<220>
<221> misc_feature
<222> (107)..(107)
<223> n is a, c, or t

<220>
<221> misc_feature
<222> (121)..(121)
<223> n is a, c, or g

<220>
<221> misc_feature
<222> (122)..(122)
<223> n is a, c, or t

<220>

<221> misc_feature
<222> (125)..(125)
<223> n is c or g

<220>
<221> misc_feature
<222> (130)..(130)
<223> n is a, c or g

<220>
<221> misc_feature
<222> (131)..(131)
<223> n is c, g or t

<400> 84
ggcgccaagc ctgacttctg cttcctcgag gagnntnnng ggnnttgcnt tgntnntttt 60

nnncgttnnt tctataataa ccaggctaag caatgtnngn nattcnnata tggtggttgc 120

nnggntaatn ngaacaactt cgagactcta gaagagtgta agaacatatg tgaggatggt 180

ggtgctgaga ctgttgagtc t 201

<210> 85
<211> 67
<212> PRT
<213> Artificial Sequence

<220>

<223> LACI-D2 hNE library

<220>
<221> misc_feature
<222> (12)..(12)
<223> Xaa is Cys, Arg, Ser, Gly, Tyr, His, Asp or Asn

<220>
<221> misc_feature
<222> (13)..(13)
<223> Xaa is Pro, His, Thr, Asn, Lys, Arg, Ser, Ala, Glu, Gly, Asp or Gln

<220>
<221> misc_feature
<222> (15)..(15)
<223> Xaa is His, Arg, Pro, Leu, Asn, Ser, Ile or Thr

<220>
<221> misc_feature
<222> (17)..(17)
<223> Xaa is Val or Ile

<220>
<221> misc_feature
<222> (18)..(18)
<223> Xaa is Gly or Ala

<220>
<221> misc_feature
<222> (19)..(19)
<223> Xaa is Phe, Leu, Ile, Val, Tyr, His, Asn or Asp

<220>
<221> misc_feature
<222> (21)..(21)
<223> Xaa is Ile, Asn, Gln, Met, Leu, His, Lys, Pro, Thr or Arg

<220>
<221> misc_feature
<222> (23)..(23)
<223> Xaa is Cys, Phe, Leu, Tyr or Trp

<220>
<221> misc_feature
<222> (33)..(33)
<223> Xaa is Leu, Gln, Glu or Val

<220>
<221> misc_feature
<222> (34)..(34)
<223> Xaa is Gln, Gly, Leu, Pro, Thr, Lys, Val, Ile, Glu, Ala or Arg

<220>
<221> misc_feature
<222> (36)..(36)
<223> Xaa is Gln, Leu, Pro, Thr, Val, Glu, Ile, Ala or Lys

<220>
<221> misc_feature
<222> (41)..(41)
<223> Xaa is Gln, Pro, Thr, Lys, Val, Met, Glu, Ala or Leu

<220>
<221> misc_feature
<222> (42)..(42)
<223> Xaa is Gly or Ala

<220>
<221> misc_feature
<222> (44)..(44)
<223> Xaa is Arg, Gly, Lys, Glu, Leu, Gln, Met or Val

<400> 85

Gly Ala Lys Pro Asp Phe Cys Phe Leu Glu Glu Xaa Xaa Gly Xaa Cys
1 5 10 15

Xaa Xaa Xaa Phe Xaa Arg Xaa Phe Tyr Asn Asn Gln Ala Lys Gln Cys
20 25 30

Xaa Xaa Phe Xaa Tyr Gly Gly Cys Xaa Xaa Asn Xaa Asn Asn Phe Glu
35 40 45

Thr Leu Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly Gly Ala Glu Thr
50 55 60

Val Glu Ser
65

<210> 86
<211> 51
<212> PRT
<213> Artificial Sequence

<220>

<223> definition of aprotonin-like Kunitz domain (p. 11)

<220>
<221> misc_feature
<222> (2)..(7)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (9)..(9)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (11)..(18)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (19)..(19)
<223> Xaa is any Tyr or Phe

<220>
<221> misc_feature
<222> (20)..(25)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (27)..(28)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (30)..(30)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (31)..(31)
<223> Xaa is Tyr, Trp or Phe

<220>
<221> misc_feature
<222> (32)..(32)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (35)..(38)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (39)..(39)
<223> Xaa is Asn or Gly

<220>
<221> misc_feature
<222> (40)..(40)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (41)..(41)
<223> Xaa is Phe or Tyr

<220>
<221> misc_feature
<222> (42)..(46)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (48)..(50)
<223> Xaa is any amino acid
<400> 86

Cys Xaa Xaa Xaa Xaa Xaa Xaa Gly Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa
1 5 10 15
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa Phe Xaa Xaa Xaa
20 25 30

Gly Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa

35 40 45

Xaa Xaa Cys
50

<210> 87
<211> 58
<212> PRT
<213> Bos Taurus

<400> 87

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1 5 10 15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 88

<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Engineered B-PTI from MARK87

<400> 88

```
Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Thr Lys Ala
1               5                  10                  15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Thr Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55
```

<210> 89
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Engineered B-PTI from MARK87

<400> 89

```
Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Ala Lys Ala
1               5                  10                  15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Ala Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55
```

<210> 90
<211> 67
<212> PRT
<213> Bos taurus (Bovine Colostrum)

<400> 90

```
Phe Gln Thr Pro Pro Asp Leu Cys Gln Leu Pro Gln Ala Arg Gly Pro
1               5                  10                  15

Cys Lys Ala Ala Leu Leu Arg Tyr Phe Tyr Asn Ser Thr Ser Asn Ala
            20                  25                  30

Cys Glu Pro Phe Thr Tyr Gly Gly Cys Gln Gly Asn Asn Asn Asn Phe
```

```
        35                  40                  45

Glu Thr Thr Glu Met Cys Leu Arg Ile Cys Glu Pro Pro Gln Gln Thr
    50                  55                  60

Asp Lys Ser
65


<210>  91
<211>  60
<212>  PRT
<213>  Bos Taurus (Bovine serum)

<400>  91

Thr Glu Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys
1               5                   10                  15

Lys Ala Ala Met Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Phe Cys
            20                  25                  30

Glu Thr Phe Val Tyr Gly Gly Cys Arg Ala Lys Ser Asn Asn Phe Lys
        35                  40                  45

Ser Ala Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55                  60



<210>  92
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  Semisynthetic BPTI, TSCH87

<400>  92

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Val Ala
1               5                   10                  15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55


<210>  93
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>
```

<223> Semisynthetic BPTI, TSCH87

<400> 93

```
Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Gly Ala
1               5                  10                  15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55
```

<210> 94
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Semisynthetic BPTI, TSCH87

<400> 94

```
Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Ala Ala
1               5                  10                  15
Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55
```

<210> 95
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Semisynthetic BPTI, TSCH87

<400> 95

```
Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Leu Ala
1               5                  10                  15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
```

50 55

<210> 96
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Semisynthetic BPTI, TSCH87

<400> 96

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Ile Ala
1 5 10 15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 97
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Engineered BPTI, AUER87

<400> 97

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1 5 10 15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Glu Arg Thr Cys Gly Gly Ala
50 55

<210> 98
<211> 60
<212> PRT
<213> Dendroaspis polylepis polylepis (Black mamba venom I)

<400> 98

Gln Pro Leu Arg Lys Leu Cys Ile Leu His Arg Asn Pro Gly Arg Cys
1 5 10 15

```
Tyr Gln Lys Ile Pro Ala Phe Tyr Tyr Asn Gln Lys Lys Lys Gln Cys
            20                  25                  30

Glu Gly Phe Thr Trp Ser Gly Cys Gly Gly Asn Ser Asn Arg Phe Lys
        35                  40                  45

Thr Ile Glu Glu Cys Arg Arg Thr Cys Ile Arg Lys
    50                  55                  60
```

<210> 99
<211> 57
<212> PRT
<213> Dendroaspis polylepis polylepis (Black mamba venom K)

<400> 99

```
Ala Ala Lys Tyr Cys Lys Leu Pro Leu Arg Ile Gly Pro Cys Lys Arg
1               5                   10                  15

Lys Ile Pro Ser Phe Tyr Tyr Lys Trp Lys Ala Lys Gln Cys Leu Pro
            20                  25                  30

Phe Asp Tyr Ser Gly Cys Gly Gly Asn Ala Asn Arg Phe Lys Thr Ile
        35                  40                  45

Glu Glu Cys Arg Arg Thr Cys Val Gly
    50                  55
```

<210> 100
<211> 57
<212> PRT
<213> Hemachatus hemachates

<400> 100

```
Arg Pro Asp Phe Cys Glu Leu Pro Ala Glu Thr Gly Leu Cys Lys Ala
1               5                   10                  15

Tyr Ile Arg Ser Phe His Tyr Asn Leu Ala Ala Gln Gln Cys Leu Gln
            20                  25                  30

Phe Ile Tyr Gly Gly Cys Gly Gly Asn Ala Asn Arg Phe Lys Thr Ile
        35                  40                  45

Asp Glu Cys Arg Arg Thr Cys Val Gly
    50                  55
```

<210> 101
<211> 57
<212> PRT
<213> Naja nivea

<400> 101

```
Arg Pro Arg Phe Cys Glu Leu Pro Ala Glu Thr Gly Leu Cys Lys Ala
1               5                   10                  15

Arg Ile Arg Ser Phe His Tyr Asn Arg Ala Ala Gln Gln Cys Leu Glu
```

```
            20                  25                  30

Phe Ile Tyr Gly Gly Cys Gly Gly Asn Ala Asn Arg Phe Lys Thr Ile
        35                  40                  45

Asp Glu Cys His Arg Thr Cys Val Gly
    50                  55
```

<210> 102
<211> 60
<212> PRT
<213> Vipera russelli

<400> 102

```
His Asp Arg Pro Thr Phe Cys Asn Leu Pro Pro Glu Ser Gly Arg Cys
1               5                   10                  15

Arg Gly His Ile Arg Arg Ile Tyr Tyr Asn Leu Glu Ser Asn Lys Cys
            20                  25                  30

Lys Val Phe Phe Tyr Gly Gly Cys Gly Gly Asn Ala Asn Asn Phe Glu
        35                  40                  45

Thr Arg Asp Glu Cys Arg Glu Thr Cys Gly Gly Lys
    50                  55                  60
```

<210> 103
<211> 64
<212> PRT
<213> Caretta sp. (Red sea turtle egg white)

<220>
<221> misc_feature
<222> (1)..(1)
<223> Xaa is Glu or Gln

<400> 103

```
Xaa Gly Asp Lys Arg Asp Ile Cys Arg Leu Pro Pro Glu Gln Gly Pro
1               5                   10                  15

Cys Lys Gly Arg Leu Pro Arg Tyr Phe Tyr Asn Pro Ala Ser Arg Met
            20                  25                  30

Cys Glu Ser Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn Phe
        35                  40                  45

Lys Thr Lys Ala Glu Cys Val Arg Ala Cys Arg Pro Pro Glu Arg Pro
    50                  55                  60
```

<210> 104
<211> 58
<212> PRT
<213> Helix pomania

<220>

<221> misc_feature
<222> (1)..(1)
<223> Xaa is Glu or Gln

<400> 104

Xaa Gly Arg Pro Ser Phe Cys Asn Leu Pro Ala Glu Thr Gly Pro Cys
1 5 10 15

Lys Ala Ser Ile Arg Gln Tyr Tyr Tyr Asn Ser Lys Ser Gly Gly Cys
20 25 30

Gln Gln Phe Ile Tyr Gly Gly Cys Arg Gly Asn Gln Asn Arg Phe Asp
35 40 45

Thr Thr Gln Gln Cys Gln Gly Val Cys Val
50 55

<210> 105
<211> 57
<212> PRT
<213> Dendroaspis angusticeps (Eastern green mamba C13 S1 C3 toxin)

<400> 105

Ala Ala Lys Tyr Cys Lys Leu Pro Val Arg Tyr Gly Pro Cys Lys Lys
1 5 10 15

Lys Phe Pro Ser Phe Tyr Tyr Asn Trp Lys Ala Lys Gln Cys Leu Pro
20 25 30

Phe Asn Tyr Ser Gly Cys Gly Gly Asn Ala Asn Arg Phe Lys Thr Ile
35 40 45

Glu Glu Cys Arg Arg Thr Cys Val Gly
50 55

<210> 106
<211> 59
<212> PRT
<213> Dendroaspis angusticeps (Eastern green mamba C13 S2 C3 toxin)

<220>
<221> misc_feature
<222> (1)..(1)
<223> Xaa is Glu or Gln

<400> 106

Xaa Pro Arg Arg Lys Leu Cys Ile Leu His Arg Asn Pro Gly Arg Cys
1 5 10 15

Tyr Asp Lys Ile Pro Ala Phe Tyr Tyr Asn Gln Lys Lys Lys Gln Cys
20 25 30

Glu Arg Phe Asp Trp Ser Gly Cys Gly Gly Asn Ser Asn Arg Phe Lys

```
        35                  40                  45

Thr Ile Glu Glu Cys Arg Arg Thr Cys Ile Gly
    50                  55


<210>  107
<211>  57
<212>  PRT
<213>  Dendroaspis polylepis polylepis (Black mamba B toxin)

<400>  107

Arg Pro Tyr Ala Cys Glu Leu Ile Val Ala Ala Gly Pro Cys Met Phe
1               5                   10                  15

Phe Ile Ser Ala Phe Tyr Tyr Ser Lys Gly Ala Asn Lys Cys Tyr Pro
            20                  25                  30

Phe Thr Tyr Ser Gly Cys Arg Gly Asn Ala Asn Arg Phe Lys Thr Ile
        35                  40                  45

Glu Glu Cys Arg Arg Thr Cys Val Val
    50                  55


<210>  108
<211>  59
<212>  PRT
<213>  Dendroaspis polylepis polylepis (Black mamba E toxin)


<400>  108

Leu Gln His Arg Thr Phe Cys Lys Leu Pro Ala Glu Pro Gly Pro Cys
1               5                   10                  15

Lys Ala Ser Ile Pro Ala Phe Tyr Tyr Asn Trp Ala Ala Lys Lys Cys
            20                  25                  30

Gln Leu Phe His Tyr Gly Gly Cys Lys Gly Asn Ala Asn Arg Phe Ser
        35                  40                  45

Thr Ile Glu Lys Cys Arg His Ala Cys Val Gly
    50                  55


<210>  109
<211>  61
<212>  PRT
<213>  Vipera ammodytes TI toxin

<220>
<221>  misc_feature
<222>  (1)..(1)
<223>  Xaa is Glu or Gln

<400>  109

Xaa Asp His Pro Lys Phe Cys Tyr Leu Pro Ala Asp Pro Gly Arg Cys
1               5                   10                  15
```

```
Lys Ala His Ile Pro Arg Phe Tyr Tyr Asp Ser Ala Ser Asn Lys Cys
            20                  25                  30

Asn Lys Phe Ile Tyr Gly Gly Cys Pro Gly Asn Ala Asn Asn Phe Lys
        35                  40                  45

Thr Trp Asp Glu Cys Arg Gln Thr Cys Gly Ala Ser Ala
    50                  55                  60


<210>  110
<211>  62
<212>  PRT
<213>  Vipera ammodytes CTI toxin

<400>  110

Arg Asp Arg Pro Lys Phe Cys Tyr Leu Pro Ala Asp Pro Gly Arg Cys
1               5                   10                  15

Leu Ala Tyr Met Pro Arg Phe Tyr Tyr Asn Pro Ala Ser Asn Lys Cys
            20                  25                  30

Glu Lys Phe Ile Tyr Gly Gly Cys Arg Gly Asn Ala Asn Asn Phe Lys
        35                  40                  45

Thr Trp Asp Glu Cys Arg His Thr Cys Val Ala Ser Gly Ile
    50                  55                  60


<210>  111
<211>  62
<212>  PRT
<213>  Bungarus fasciatus VIII B toxin

<400>  111

Lys Asn Arg Pro Thr Phe Cys Asn Leu Leu Pro Glu Thr Gly Arg Cys
1               5                   10                  15

Asn Ala Leu Ile Pro Ala Phe Tyr Tyr Asn Ser His Leu His Lys Cys
            20                  25                  30

Gln Lys Phe Asn Tyr Gly Gly Cys Gly Gly Asn Ala Asn Asn Phe Lys
        35                  40                  45

Thr Ile Asp Glu Cys Gln Arg Thr Cys Ala Ala Lys Tyr Gly
    50                  55                  60


<210>  112
<211>  59
<212>  PRT
<213>  Anemonia sulcata

<400>  112

Ile Asn Gly Asp Cys Glu Leu Pro Lys Val Val Gly Pro Cys Arg Ala
1               5                   10                  15
```

Arg Phe Pro Arg Tyr Tyr Tyr Asn Ser Ser Ser Lys Arg Cys Glu Lys
20 25 30

Phe Ile Tyr Gly Gly Cys Gly Gly Asn Ala Asn Asn Phe His Thr Leu
35 40 45

Glu Glu Cys Glu Lys Val Cys Gly Val Arg Ser
50 55

<210> 113
<211> 56
<212> PRT
<213> Homo sapiens

<400> 113

Lys Glu Asp Ser Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Met Gly
1 5 10 15

Met Thr Ser Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
20 25 30

Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
35 40 45

Lys Glu Cys Leu Gln Thr Cys Arg
50 55

<210> 114
<211> 61
<212> PRT
<213> Homo sapiens

<400> 114

Thr Val Ala Ala Cys Asn Leu Pro Val Ile Arg Gly Pro Cys Arg Ala
1 5 10 15

Phe Ile Gln Leu Trp Ala Phe Asp Ala Val Lys Gly Lys Cys Val Leu
20 25 30

Phe Pro Tyr Gly Gly Cys Gln Gly Asn Gly Asn Lys Phe Tyr Ser Glu
35 40 45

Lys Glu Cys Arg Glu Tyr Cys Gly Val Pro Gly Asp Glu
50 55 60

<210> 115
<211> 60
<212> PRT
<213> Bungarus multicinctus (beta bungarotoxin B1)

<400> 115

```
Arg Gln Arg His Arg Asp Cys Asp Lys Pro Pro Asp Lys Gly Asn Cys
1               5                  10                  15

Gly Pro Val Arg Ala Phe Tyr Tyr Asp Thr Arg Leu Lys Thr Cys Lys
            20                  25                  30

Ala Phe Gln Tyr Arg Gly Cys Asp Gly Asp His Gly Asn Phe Lys Thr
        35                  40                  45

Glu Thr Leu Cys Arg Cys Glu Cys Leu Val Tyr Pro
    50                  55                  60
```

<210> 116
<211> 60
<212> PRT
<213> Bungarus multicinctus (beta bungarotoxin B2)

<400> 116

```
Arg Lys Arg His Pro Asp Cys Asp Lys Pro Pro Asp Thr Lys Ile Cys
1               5                  10                  15

Gln Thr Val Arg Ala Phe Tyr Tyr Lys Pro Ser Ala Lys Arg Cys Val
            20                  25                  30

Gln Phe Arg Tyr Gly Gly Cys Asp Gly Asp His Gly Asn Phe Lys Ser
        35                  40                  45

Asp His Leu Cys Arg Cys Glu Cys Glu Leu Tyr Arg
    50                  55                  60
```

<210> 117
<211> 58
<212> PRT
<213> Bos taurus

<400> 117

```
Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1               5                  10                  15

Lys Met Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Phe Cys Glu Thr
            20                  25                  30

Phe Val Tyr Gly Gly Cys Lys Ala Lys Ser Asn Asn Phe Arg Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55
```

<210> 118
<211> 61
<212> PRT
<213> Tachypleus tridentatus

<400> 118

Thr Glu Arg Gly Phe Leu Asp Cys Thr Ser Pro Pro Val Thr Gly Pro
1 5 10 15

Cys Arg Ala Gly Phe Lys Arg Tyr Asn Tyr Asn Thr Arg Thr Lys Gln
20 25 30

Cys Glu Pro Phe Lys Tyr Gly Gly Cys Lys Gly Asn Gly Asn Arg Tyr
35 40 45

Lys Ser Glu Gln Asp Cys Leu Asp Ala Cys Ser Gly Phe
50 55 60

<210> 119
<211> 63
<212> PRT
<213> Bombyx mori

<400> 119

Asp Glu Pro Thr Thr Asp Leu Pro Ile Cys Glu Gln Ala Phe Gly Asp
1 5 10 15

Ala Gly Leu Cys Phe Gly Tyr Met Lys Leu Tyr Ser Tyr Asn Gln Glu
20 25 30

Thr Lys Asn Cys Glu Glu Phe Ile Tyr Gly Gly Cys Gln Gly Asn Asp
35 40 45

Asn Arg Phe Ser Thr Leu Ala Glu Cys Glu Gln Lys Cys Ile Asn
50 55 60

<210> 120
<211> 56
<212> PRT
<213> Bos taurus

<400> 120

Lys Ala Asp Ser Cys Gln Leu Asp Tyr Ser Gln Gly Pro Cys Leu Gly
1 5 10 15

Leu Phe Lys Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
20 25 30

Phe Leu Tyr Gly Gly Cys Met Gly Asn Leu Asn Asn Phe Leu Ser Gln
35 40 45

Lys Glu Cys Leu Gln Thr Cys Arg
50 55

<210> 121
<211> 61
<212> PRT
<213> Bos taurus

<400> 121

Thr Val Glu Ala Cys Asn Leu Pro Ile Val Gln Gly Pro Cys Arg Ala
1 5 10 15

Phe Ile Gln Leu Trp Ala Phe Asp Ala Val Lys Gly Lys Cys Val Arg
20 25 30

Phe Ser Tyr Gly Gly Cys Lys Gly Asn Gly Asn Lys Phe Tyr Ser Gln
35 40 45

Lys Glu Cys Lys Glu Tyr Cys Gly Ile Pro Gly Glu Ala
50 55 60

<210> 122
<211> 58
<212> PRT
<213> Artificial Sequence

<220>

<223> Engineered BPTI (KR15, ME52)

<400> 122

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Arg Ala
1 5 10 15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
35 40 45

Glu Asp Cys Glu Arg Thr Cys Gly Gly Ala
50 55

<210> 123
<211> 59
<212> PRT
<213> Artificial Sequence

<220>

<223> Isoaprotinin G-1

<220>
<221> misc_feature
<222> (1)..(1)
<223> Xaa is Glu or Gln

<400> 123

Xaa Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys
1 5 10 15

Ala Arg Met Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln

```
            20                  25                  30

Pro Phe Val Tyr Gly Gly Cys Arg Ala Lys Ser Asn Asn Phe Lys Ser
        35                  40                  45

Ala Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55


<210>  124
<211>  58
<212>  PRT
<213>  Artificial Sequence

<220>

<223>  Isoaprotinin 2

<400>  124

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1               5                   10                  15

Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Pro
            20                  25                  30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ser
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55


<210>  125
<211>  58
<212>  PRT
<213>  Artificial Sequence
<220>

<223>  Isoaprotinin G-2

<400>  125

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1               5                   10                  15

Arg Met Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Pro
            20                  25                  30

Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
        35                  40                  45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
    50                  55


<210>  126
<211>  58
<212>  PRT
<213>  Artificial Sequence
```

<220>

<223> Isoaprotinin 1

<400> 126

Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1 5 10 15

Lys Met Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Phe Cys Glu Thr
20 25 30

Phe Val Tyr Gly Gly Cys Lys Ala Lys Ser Asn Asn Phe Arg Ser Ala
35 40 45

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 127
<211> 11
<212> DNA
<213> Artificial Sequence

<220>

<223> PfMI restriction site

<220>
<221> misc_feature
<222> (4)..(8)
<223> n is a, c, g or t

<400> 127

ccannnnntg g 11

<210> 128
<211> 15
<212> DNA
<213> Artificial Sequence

<220>

<223> XcmI restriction site

<220>
<221> misc_feature
<222> (4)..(12)
<223> n is a, c, g or t

<400> 128
ccannnnnnn nntgg 15

<210> 129
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE alpha

<400> 129

Pro Cys Val Ala Met Phe Gln Arg Tyr
1 5

<210> 130
<211> 6
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 15-20 of EpiNE-7

<400> 130

Val Ala Met Phe Pro Arg
1 5

<210> 131
<211> 4
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 35-38 of HNE

<400> 131

Tyr Gly Gly Cys
1
<210> 132
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of BPTI

<400> 132

Pro Cys Lys Ala Arg Ile Ile Arg Tyr
1 5

<210> 133
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE3

<400> 133

Pro Cys Val Gly Phe Phe Ser Arg Tyr
1 5

<210> 134
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE6

<400> 134

Pro Cys Val Gly Phe Phe Gln Arg Tyr
1 5

<210> 135
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE7

<400> 135

Pro Cys Val Ala Met Phe Pro Arg Tyr
1 5

<210> 136
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE4

<400> 136

Pro Cys Val Ala Ile Phe Pro Arg Tyr
1 5

<210> 137
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE8

<400> 137

Pro Cys Val Ala Ile Phe Lys Arg Ser
1 5

<210> 138
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE1

<400> 138

Pro Cys Ile Ala Phe Phe Pro Arg Tyr
1 5

<210> 139
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE5

<400> 139

Pro Cys Ile Ala Phe Phe Gln Arg Tyr
1 5

<210> 140
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> amino acids 13-21 of EpiNE2

<400> 140

Pro Cys Ile Ala Leu Phe Lys Arg Tyr
1 5

<210> 141
<211> 58
<212> PRT
<213> Artificial sequence

<220>

<223> BITI

<400> 141

```
Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Met Gly
1               5                  10                  15

Met Thr Ser Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
            20                  25                  30

Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55
```

<210> 142
<211> 58
<212> PRT
<213> Artificial sequence

<220>

<223> BITI-E7

<400> 142

```
Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Ala Gly Pro Cys Val Ala
1               5                  10                  15

Met Phe Pro Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
            20                  25                  30

Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55
```

<210> 143
<211> 58
<212> PRT
<213> Artificial sequence

<220>

<223> BITI-E7-1222

<400> 143

```
Arg Pro Asp Phe Cys Gln Leu Gly Tyr Ser Thr Gly Pro Cys Val Ala
1               5                  10                  15

Met Phe Pro Arg Tyr Phe Tyr Asn Gly Thr Ser Met Ala Cys Glu Thr
            20                  25                  30
```

```
Phe Gln Tyr Gly Gly Cys Met Gly Asn Gly Asn Asn Phe Val Thr Glu
        35                  40                  45

Lys Asp Cys Leu Gln Thr Cys Arg Gly Ala
    50                  55
```